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CASE STUDIES AND WORKING PAPERS PRESENTED AT THE EXPERT CONSULTATION ON STRATEGIES FOR FISHERIES DEVELOPMENT

Rome, 10-14 May 1983

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ÉTUDES DE CAS ET DOCUMENTS DE TRAVAIL PRÉSENTÉS A LA CONSULTATION D'EXPERTS SUR LES STRATÉGIES DE DÉVELOPPEMENT DES PÊCHES

Rome, 10-14 mai 1983

ESTUDIOS DE CASOS Y DOCUMENTOS DE TRABAJO PRESENTADOS EN LA CONSULTA DE EXPERTOS PARA EL DESARROLLO PESQUERO

Roma, 10-14 de mayo de 1983

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE
ORGANIZACION DE LAS NACIONES UNIDAS PARA LA AGRICULTURA Y LA ALIMENTACION

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FAO, Rapport sur les pêches N° 295 Supplément FIPP/R295 Suppl.(TRI)
FAO, Informes de Pesca N° 295 Suplemento

CASE STUDIES AND WORKING PAPERS PRESENTED AT THE EXPERT CONSULTATION ON STRATEGIES FOR FISHERIES DEVELOPMENT (with particular reference to small-scale fisheries)

ETUDES DE CAS ET DOCUMENTS DE TRAVAIL PRESENTES A LA CONSULTATION D'EXPERTS SUR LES STRATEGIES DE DEVELOPPEMENT DES PECHES (notamment des pêches artisanales)

ESTUDIOS DE CASOS Y DOCUMENTOS DE TRABAJO PRESENTADOS EN LA CONSULTA DE EXPERTOS PARA EL DESARROLLO PESQUERO (con especial referencia a la pesca artesanal)

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Rome/Roma 1983

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PREPARATION OF THE DOCUMENT

This supplement to the Report of the Expert Consultation on Strategies for Fisheries Development (with particular reference to small-scale fisheries) (FAO Fisheries Report No. 295) contains the selected case studies on strategies for fisheries development and the working papers presented at the Consultation. The case studies are presented in the language of original submission. All the working papers are presented in English except one, "Pêches et stratégies de développement, discours et pratiques", presented in French. The proceedings of the Consultation are available in English, French and Spanish (FAO Fisheries Report No.295).

PREPARATION DU DOCUMENT

Ce supplément au Rapport de la Consultation d'Experts sur les Stratégies de Développement des Pêches (notamment des pêches artisanales) (FAO Rapport sur les Pêches No.295) contient les études de cas sélectionnées sur les stratégies pour le développement des pêches et les documents de travail présentés à la Consultation. Ces études de cas sont présentées dans la langue originale de soumission. Tous les documents de travail sont présentés en anglais, sauf un, "Pêches et stratégies de développement, discours et pratiques", présenté en français. Les comptes rendus de la Consultation sont disponibles en anglais, français et espagnol (FAO Rapport sur les Pêches No.295).

PREPARACION DEL DOCUMENTO

Este suplemento al informe de la Consulta de Expertos sobre Estratégias para el Desarrollo Pesquero (con especial referencia a la pesca artesanal) (FAO Informes de Pesca No.295) contiene los estudios de caso seleccionados sobre estratégias para el desarrollo de pesca y los documentos de trabajo presentados en la Consulta. Los estudios de caso se presentan en lengua original en que fueron escritos. Todos los documentos de trabajo se presentan en inglés, a excepción de uno,"Pêches et stratégies de développement, discours et pratiques", presentado en francés. Las actas de la Consulta están disponibles en inglés, francés y español (FAO Informes de Pesca No.295).

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ABSTRACT

This volume contains the full texts of 11 case studies and 15 working papers prepared for the Expert Consultation on Strategies for Fisheries Development, a preparatory meeting for the FAO World Conference on Fisheries Management and Development, held in Rome from 10 to 14 May 1983.

RESUME

Ce volume contient les textes complets de 11 études de cas ainsi que 15 documents de travail préparés pour la Consultation d'Experts sur les Stratégies de Développment des Pêches qui s'est tenue à Rome du 10 au 14 mai 1983 en vue de préparer la Conférence mondiale de la FAO sur l'Aménagement et le Développement des Pêches.

ABSTRACTO

Este volumen contiene los textos completos de 11 estudios de casos y 15 documentos de trabajo preparados para la Consulta de Expertos sobre Estratégias para el Desarrollo de la Pesca, una reunión preparatoria a la Conferencia Mundial de la FAO sobre Ordenación y Desarrollo Pesqueros, se llevó a cabo en Roma del 10 a 14 de mayo de 1983.

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POLICIES AND STRATEGIES FOR FISHERIES DEVELOPMENT: SOME RELEVANT ISSUES FOR DEVELOPING COUNTRIES

by

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ABSTRACT

This paper provides the definitions for the basic concepts used in fisheries development, management and planning. Past strategies are reviewed and the reasons for previous failures briefly analysed. The author then discusses alternative models for fisheries development and examines such subjects as production for national versus international markets; artisanal versus industrial fisheries; locally developed research and technology versus imported know-how and the need for an intersectoral approach to planning and the integration of fisheries into rural development as a whole.

INTRODUCTION

FAO is organizing a World Conference on Fisheries Management and Development which aims, *inter alia*, to promote recognition of the need to redefine policies and change practices in fisheries, at national and regional level, and to respond to the new situation created by the national jurisdiction over fish resources in zones commonly extending 200 mi seaward. The practical realities of this new regime of the oceans are complex and challenging for all coastal countries but particularly so for developing countries which now have enhanced opportunities to reap full benefit from the living resources off their shores.

This new situation appears at a moment when fisheries are passing through a period of crucial change, characterized by the increasing costs of operations for large-scale fishing, due partly to an increase in fuel costs; by competing utilization of sea resources (rapid urbanization, industrialization in coastal areas); by conflicts between types of fishing; by overfishing of many species, etc. Some countries, particularly the developing ones, have now realized that fishing technologies and production systems, imported from outside in a period of low-cost fuel energy, are no longer suitable to achieve proposed objectives for fisheries development.

An increasing number of countries are trying to re-evaluate their past efforts and re-allocate their resources more efficiently through the establishment of fisheries development plans with stated objectives and strategies. However, very often, these plans have been ineffective because contradictions between objectives were not properly solved through the establishment of appropriate policies and strategies.

In this connection, the change in the jurisdiction of the oceans, which creates new conditions for the development of fisheries, calls for a review of policies and strategies leading to the achievement of economic and social objectives of fisheries plans. Domestic fisheries, and in particular small-scale fisheries, may be called upon to play a crucial role in the new strategies and alternatives for fisheries development.

In order to prepare for the World Conference, whose technical phase will be held in October 1983 followed by its major policy phase scheduled for late June 1984, FAO is organizing a series of consultations and seminars. In particular, an Expert Consultation

on Strategies for Fisheries Development, to take place in Rome from 10 to 14 May 1983, which will bring together experts from different parts of the world to:

(a) discuss existing strategies and suggest alternative approaches for fisheries development in the light of the UN-supported New International Economic Order and of the New Ocean Regime; and
(b) consider a new role for the domestic, small-scale fisheries, especially in the light of the recommendations of the World Conference on Agrarian Reform and Rural Development.

Issues related to strategies for fisheries development are numerous and of a broad nature. The present discussion paper deals with some crucial problems and options which coastal countries, in particular the developing ones, face in the fisheries sector, and is intended to stimulate useful discussions among participants of the above-mentioned Expert Consultation. Needless to say, the views expressed in this paper are those of the author and do not necessarily represent the views of FAO.

BASIC DEFINITIONS AND OPERATIONAL CONCEPTS

Fisheries Development

Fisheries development is often considered to be a phase characterized by the possibility of increasing physical output from underexploited or new fisheries resources. It is also often characterized by the expansion of effective effort (new boats, gear, etc.). As opposed to this 'development' phase, the subsequent phase would be of mature fisheries in which a certain adjustment would occur between the level of investment (boats, gears, etc.) and the fisheries resources. At this stage fisheries expansion would cease and management would be needed.

This definition of fisheries development is insufficient because it takes into consideration only the 'production growth aspect' without including other essential issues such as income distribution among the population and the self-sustaining aspect of the process. Objectives for fisheries development have to be linked to the objectives of national development which were defined by the 11th Special Session of the UN General Assembly as part of the Third Development Decade of the United Nations: "The ultimate aim of development is the constant improvement of the well-being of the entire population on the basis of its full participation in the process of development and a fair distribution of the benefits therefrom. In this perspective, economic growth, productive employment and social equity are fundamental and indivisible elements of development. The international development strategy should, therefore, fully reflect the need for the adoption of adequate and appropriate policies, to be defined by each country within the framework of its development plans and priorities, for movement toward the realization of this ultimate goal of development. The pace of development in the developing countries as a whole should be accelerated substantially in order to enable them to achieve these objectives." (UN/General Assembly A/35/464 of 23.10.80).

Fisheries development is a multivariable process, having economic (growth), socio-political (equity) and biological (sustained basis) objectives. This also means that it is a sectoral aspect of a global process - by which the basic needs (food, income, shelter, education, etc.) of local populations are fulfilled. It also means that fisheries development is not a spontaneous process, although it has a natural resources basis and, to a certain extent, is determined by it (the availability of resources). Fisheries development is a human, socio-economic process through which a certain population engaged in the fishing sector gets its livelihood and contributes to the welfare of a larger group of people (through food supply, foreign exchange, etc.).

The economic growth, as one of the objectives of fisheries development, can be reached not only through physical increase in output but also through increase in productivity and in the value of the product (value added). This can be done through improvement

of processing methods, better commercialization schemes, etc. This also means that development can take place even when the physical output cannot be increased because of danger of overfishing.

The development process requires also an equitable distribution of the economic benefits. Very often basic societal changes are also required in order to allow this distributive feature to take place. This equitable distribution of the economic benefits should take place not only among social groups but also among areas and regions inside countries. In many cases fisheries is an important activity of a backward littoral area and government support to this economic sector can be considered as an instrument to achieve a balance among developed and depressed regions inside the country.

In this context it should be remembered that fisheries development is also a political and institutional process as it deals with the allocation of benefits among different groups in the society. People's participation, and in particular fishermen's participation, through appropriate associations, in the decision-making process at the planning and implementing stages becomes an important condition for development.

Development is also a diversified process and needs to take into account the characteristics of the ecosystems existing in the various coastal areas. Planning for development should be directed toward a better utilization of resources existing in different ecosystems, aiming primarily at the satisfaction of basic needs of people using each ecosystem, respecting their local social and cultural values and assuring a reasonable level of equity and ecological balance.

Fisheries Management

Given the specific characteristics of each fishery (mobility of the fish stocks, seasonality and variations of resources and markets, common property, etc.), very often it is difficult to adjust the harvesting capability (fleets, gear, etc.) to the size and type of fisheries resources in order to achieve development objectives as defined earlier. This adjustment may imply fishing control measures (quotas, licensing, mesh size limits, etc.) which have different impacts on particular groups of fishermen (artisanal, industrial, etc.). Basically, management comprises practices aiming to keep the resources at a high level of productivity by matching fishing effort to the condition of the stocks. Management should, therefore, be applied to underexploited stocks as well as to stocks reaching overexploitation, although it has been applied mainly to the latter.

Management, therefore, deals with the use of a set of tools needed in order to achieve or maintain a development process. Fisheries development is a broader concept, involving also social and political processes. Objectives are established by the society or their governments and are known as 'developmental objectives'. By no means should the concept of management be opposed to that of development, which is the more relevant issue, particularly for the Third World countries.

An 'optimum' level of exploitation should be decided on the basis of a set of 'developmental objectives', recognizing the variable nature of natural resources. It would be misleading to use only one criteria (biological, economic or social) to define the optimum level of resources exploitation. The objectives for fisheries development, as stated earlier, should provide the criteria to establish this 'optimum' which has to be defined in each case. For example, a fishery strategy which leads to the depletion or waste of resources cannot be considered a sound one. In many cases, such as in the commercial shrimp fisheries, financial analysis does not include hidden costs such as the large amount of 'trash' fish which is thrown away and that should be included as ecological costs. Financial objectives to achieve highest rates of return to individual investors are not necessarily relevant for development. Experience in developing countries has shown that this objective might favour only a few boatowners, processors and traders and lead easily to the depletion of resources and to the impoverishment of a great number of artisanal fishermen exploiting the same stocks.

Looking on the 'growth side', there are various biological limits on the exploitation of the fish resources. When these limits are not respected, overfishing occurs, endangering the reproduction of the fish stocks. The causes of overfishing cannot be explained solely by the so-called 'common property' characteristic of fisheries, and by the 'free entry' of fishermen and boats into an expanding fishery with the consequent dissipation of

resources and rents, or by any unique value patterns and cultural attitudes of the fishermen. Factors such as market fluctuations, the low prices received by fishermen, the concentration of capital investment to harvest only a few selected species, etc., should also be considered. In many societies, fishing communities have traditional rights over the fishing grounds close to their villages which hinders 'free entry' (Emerson, 1980). In others, fishing is only undertaken by specific castes and social groups. Even today, free entry of new fishermen into coastal fishing in periods of great abundance of fish is limited by difficulties of acquiring know-how and capital. The concept of free entry to explain overinvestment and overfishing was more relevant when fleets from distant industrialized nations were deployed from one highly-priced fish stock after another. However, it is less likely to apply in the fisheries context of most third world countries where mobility of production factors is often smaller. Overfishing and overinvestment has to be explained, as mentioned above, by a series of factors including target-fishing for highly profitable species; market structures; inappropriate subsidy policies, etc.

Fisheries Development Planning

Socio-economic planning has been largely utilized by governments to allocate resources to regions and groups and to bring about social changes and development. Planning as a process has also been utilized to control, to correct or to limit market forces. In the development process, if the entire allocation of capital resources were dictated only by market forces, investment by private entrepreneurs would be directed mainly to highly profitable industries in promising regions. When it comes to the utilization of renewable resources, the role of the government is essential because private investors who are used to internalize profits and externalize costs as much as they can, tend to generate pollution, waste, etc. and incur public costs. In the last 20 years a growing number of developing countries have been using planning as a tool to allocate scarce resources among sectors and regions and to bring about or accelerate development.

Planning is usually defined as an integrated process combining (a) definition of objectives and setting priorities; (b) selection of policies and strategies as well as guidelines and targets for programming; (c) selection of programmes and projects. Basically, step (a) is of a political nature because the setting of objectives usually reflects conflicting aspirations of social groups. Many interests have to be accommodated and the determination of social objectives is usually an outcome of negotiation among them. Step (b) is also mainly of a political nature but planners are called upon to present options to maximize the intended impact and to minimize possible conflicts between objectives and strategies. Step (c) is mainly of a technical nature.

According to the degree of control over the economic forces, planning may vary from directive to indicative planning. As most developing countries have mixed economies, with both public and private sectors, planning in practice tends to be a combination of the different basic types of planning. This results in national plans with general development objectives for the economy and an investment programme for the public sector. Sectoral plans (industrial, fisheries) deal with specific areas of production, setting specific targets which should be consistent with those of the national plan.

Confusion often arises because the terms 'objectives', 'policy', and 'strategy' tend to be used to mean different things in different contexts. In this paper the terms are used to mean the following:

(a) Objectives: general goals (short, medium, long-term) to be attained (economic growth, increased standard of living of the population, etc.);
(b) Goals and targets: interpretation of objectives into physical and quantitative terms;
(c) Policies: indicate selected options and choices to achieve general development objectives, taking into account ecological, socio-political and economic criteria and constraints;
(d) Strategies: are ways and means selected in order to implement policies;
(e) Policy instruments: are also often used to indicate specific tools (taxes, price controls) designed to carry out selected policies.

Because strategies vary according to different local conditions (institutional arrangements, availability of natural resources, capital and labour), this paper deals mainly with policy options and constraints and their implications for fisheries development.

A clear definition of objectives is one of the most important steps in the formulation of the plan, since it is a precondition for the establishment of a coherent strategy for allocating scarce investment resources between competing demands. Without a clear definition of objectives and priorities, targets, programmes and projects are likely to be chosen arbitrarily, and policies and measures to implement a plan are likely to be contradictory.

In many fisheries development plans, planners are faced with conflicts reflecting different kinds of social and economic interests that have to be accommodated through appropriate policies and strategies: conflicts between types of fisheries competing for the same resources or fishing areas; e.g., industrial versus artisanal fisheries; conflicts between different social groups (such as boatowners, crewmen, traders, owners of processing plants, workers, etc.); conflicts of interests between different economic sectors on the use of the same marine area (e.g., sea-based industries, tourism, agriculture, etc.). A typical example is where governments have to make decisions on the conflicting uses of biologically rich ecosystems such as estuaries, lagoons and coastal areas.

Because the establishment of priorities implies decisions on the allocation of scarce resources to specific sectors and has strong political implications, some fishery development plans present objectives that, although each one may have been desirable by itself, in combination they are contradictory and incompatible. In order to avoid difficult decisions, political authorities frequently prefer to list objectives which are mutually inconsistent. One can find conflicting economic and social objectives (e.g., to increase fisheries output through capital-intensive investment and at the same time increase employment); or incompatible long and short-term objectives (e.g., to establish a diversified fishing industry and give subsidies only to increase output of the shrimp industry for export); or incompatible objectives and policies (e.g., to improve the standard of living of artisanal fishermen and establish price policies which favour only traders), etc. Conflicting objectives may be included in the plan if priorities are indicated and appropriate strategies are devised to achieve objectives. For instance, both industrial and artisanal sectors might increase output to a certain limit if different fishing areas are clearly defined.

Once objectives have been decided upon, the planning process moves to the selection of policy options and strategies for action. A policy objective can be achieved using various alternative strategies. Strategies are unlikely to be of the 'either/or' type: in most cases, to attain a certain objective, mixed strategies are used. The selection and combination of strategies is the most crucial part of the planning process as these set the whole orientation for the plan.

Major options (e.g., small versus large-scale fisheries; domestic versus foreign fishing; various arrangements for foreign involvement, etc.) should be compared to determine their respective merits to reach selected goals (Jarrold and Everett, 1981). Specific techniques for selecting alternative policies and harmonization between strategies can be used at this stage. Very often planners are inclined to concentrate only on the level of programme and project design (tactical level), which may lead to the more relevant issues, such as policies and strategies, being forgotten.

PAST STRATEGIES: SUCCESSES AND FAILURES

The Expansionist/Capital-Intensive Growth Model

The evolution of fisheries in most developed countries has been based on capital-intensive investment in both catching and processing, mainly as a response to the greater distance to fishing grounds resulting from the exhaustion of local fish stocks. The setting up of capital-intensive, high technology fishing and processing structures, sometimes vertically integrated, was a response to market structures in the industrialized countries. After the second world war a significant part of total investment in fisheries was made in response to an increasing demand for luxury sea food items and high-priced frozen fish in affluent societies.

While in some European countries family-based (artisanal) fisheries were important (Norway, Italy, etc.), fishing in many developed countries, in particular after the second world war, was done mainly through industrial, company-owned boats, and fish processing was made through sophisticated, highly capital and energy-consuming processes.

The old ocean regime of open competition tended to prescribe a uniform pattern of fisheries objectives and fishing patterns among the various countries engaged in international fisheries. In that regime the exploitation of fisheries resources was open to all, but, in practice, countries with technological capabilities and capital benefitted more than others from free access to common property resources.

In the last decade efforts to promote the development of fisheries in many countries, including the provision of technical assistance to the fishery sector, were mainly (whether explicitly or implicitly) based on:

- the worldwide expansion of the activities of long-distance fleets operating from countries in the northern hemisphere;
- the transposition of this expansion model in the promotion of fishery development to third world countries (Troadec, 1982a).

Meanwhile, during the worldwide expansion of the activities of long-distance fleets, fisheries in many developing countries represented a rather traditional economic sector directed mainly toward the supply of fish for their internal market. Most fishing was then done by artisanal fishermen. In the last 20 years, when some developing countries started modernizing their fishing activities, they have often followed the general pattern of exporting raw material luxury fish species to industrialized nations utilizing technology and production structures often externally determined. One example is fish meal exported from South American waters to feed chicken and domestic animals in industrialized nations. Another example is the emphasis placed on the export of shrimp and lobster.

In developing countries several models for fisheries development have been employed. Most are dualistic in structure: within the fisheries a traditional artisanal sector supplies fish mainly to the local markets and a modern sector using foreign-owned modern boats (and some state-owned vessels) produce for export (some cases in West Africa). In other cases, for example in some countries in Latin America, a capital-intensive industrial private fishing sector was superimposed over an artisanal and/or semi-industrial, family-based productive structure. Through a series of financial incentives and subsidies, this new sector was mainly directed to fish for export. Before this type of fishery development model was chosen, there were cases where the artisanal and semi-industrial sectors had reached a considerable degree of organization of production. Bottlenecks hampering further development of the artisinal and semi-industrial sectors were found not in the production side but were due to lack of infrastructures and communications (transport, marketing, storage, etc.). The new export-oriented fishing structures (sophisticated boats, cold-storage facilities, etc.), which were established through large imports from developed countries, had to be repaid quickly. As a consequence, most of the enterprises concentrated on highly profitable species such as shrimp, lobster, etc. (with the estimated colossal loss of 3-5 million tons of by-catch fish per year).

Needless to say, in a few years, the combination of long-distance fishing by fleets of foreign countries and the frequently competing local modern fisheries led to intensive exploitation of resources and decreasing returns. Many countries, in spite of urgent problems to feed their own populations, have embarked on export-oriented luxury seafood. This unbalanced strategy, disregarding the food need of large sectors of the local population, has been not only wasteful in capital but also in fish resources.

Very often processing plants designed for specific production conditions in industrialized nations have been found to be inappropriate for situations prevailing in tropical areas, in particular in countries with multispecies fish resources. Highly sophisticated factory ships or large freezer-trawlers might represent adequate technologies when capital and resources are abundant, but they may not be suitable for situations existing in developing countries. In some cases economy of scale might be reached through more labour-intensive technology and a greater number of smaller units.

The other side of the coin is that, in many third world countries which followed this capital-intensive and export-oriented strategy, artisanal and semi-industrial fishermen, receiving little or no financial aid, were only able to survive due to their flexibility in adjusting to the changing environment.

The Crisis of the Growth-Oriented Model

In the early 1970s, however, new factors and events arose both inside and outside the fisheries sector which revealed the limitations of the 'growth model' and have put serious constraints on the viability of the corresponding strategies. These included the following:

(a) decline in the incremental growth rate of world fisheries, in particular after the collapse of the Peruvian anchovy (FAO, 1979);

(b) estimates of the world fishery potential yield published at the beginning of that decade suggested that it was unlikely that the effective sustainable yield from conventional resources would exceed twice the current catches;

(c) the prospects of the expansionist model became even more gloomy with the sudden and increasing price of fossil fuel, which is a major component in the overall costs of industrial fisheries;

(d) the Third Conference on the Law of the Sea officially challenged the principle of free access to the majority of world fisheries resources (Carroz, 1982). Although they did not stand to acquire the largest share of world resources, as those were primarily concentrated in high and medium latitudes, this initiative was taken primarily by developing countries (Troadec, 1982);

(e) the deterioration of terms of international trade, the intensification of trade barriers imposed by industrialized countries on semi-manufactured goods produced in third world countries, the indebtedness of many developing countries, etc.;

(f) the threat of starvation for a considerable part of the populations in less developed countries.

The result of two decades of fishery development may appear deceptive, particularly when one considers the resources available. The major reasons for this situation seem to lie in:

(i) a development which was not, under the past regime, specifically geared to the direct benefit of coastal countries;

(ii) the uncritical transposition of a development model ill-matched to the local environment, apparently because insufficient attention had been given to the appreciation of local conditions and the objective ranking of constraints (the emphasis during project identification being put on the straightforward transfers of foreign technical solutions); the lack of relevance of interventions affected both scientific and technological activities. Even prior to the increase in the price of oil, the development schemes modelled after the expansion of large-scale operations in advanced countries could have been expected to be of limited efficiency in countries where the factors and conditions for fishery development were characterized by abundant and cheap labour; multispecies fishery resources; limited investment capacities; and large sectors of the population in urgent need of cheap food supply (Troadec, 1982a);

(iii) the priority given to the direct promotion of production through the increase in fishing capacity and efficiency, as opposed to strategies based on the stimulation of comprehensive development through the improvement of infrastructures, internal market increase, administrative arrangements, training, etc.);

(iv) an insufficient recognition of the causes and mechanisms of development, especially those resulting from the peculiarities of the dynamics of a fishery taken as a whole (Troadec, 1982).

Given this scenario, the establishment of the Exclusive Economic Zones may call for new strategies for fisheries development, particularly in many developing countries. Coastal countries have, under the new regime, the authority to control the amount of fishing of both domestic fleets and foreign partners. They can now use and manage the stocks in such a way as to prevent the dissipation of economic and social benefits and the biological overfishing which characterized the past regime of open access and free competition. Insofar as it can stimulate nationally-determined development, the new ocean regime can facilitate a long-due evolution in fisheries development strategies appropriate to third world countries.

There is a growing awareness that development programmes for third world countries should be conceived through models adapted to local conditions. Given the increasing gap between the rich and poor countries, it is felt that development has to take place differently, if it is going to take place at all. It is usually the case that models based on capital-intensive systems of production, which are exclusively growth and export-oriented have also increased the gap between rich and poor inside the countries. Poverty and unemployment are rampant in most third world countries and inadequate feeding in many areas justifies a clear priority for increasing the availability of food to the people through alternative internal market-oriented production schemes. Planned exploitation of fisheries resources near to the coast, which are now nationally owned, can, in many cases, constitute the basis for a social need-oriented, technologically sound and self-reliant development process.

Before considering new options and alternative policies and strategies for fisheries development in developing countries, it is necessary to emphasize the following assumptions:

(a) development is a complex and integrated process and it is meaningless to talk about fishery development without referring to development "tout court";

(b) fisheries is part of overall primary production of a national economy and not an isolated sector of a developing economy. It should be horizontally and vertically integrated into other economic sectors;

(c) new strategies for fisheries development should be the integral part of a sound policy for the utilization of all renewable resources (forest, water, etc.) of developing countries; strategies for the optimal use of natural resources should not only consider the needs of the present but also those of future generations.

FISHERIES DEVELOPMENT: ELEMENTS FOR ALTERNATIVE MODELS

Assuming that the establishment of Exclusive Economic Zones will enable coastal nations in the third world countries to plan their fisheries development in a more consistent way, in the light of their own national interests, there is a need for a number of coastal countries to re-think their priorities and concentrate their efforts in speeding up the process of building up their own fishing structures to exploit larger resources now available to them, aiming primarily at self-sufficiency in food production. Different situations can be found in terms of resources, expertise and constraints that might call for different strategies to achieve development. As an example, there are small island states with large underexploited resources, small internal markets and few fishermen. There are countries with large internal markets, moderate potential for further expansion, large artisanal sector, insipient semi-industrial fleet, etc.

It should be clear that there are no blueprints to achieve fisheries development. The choice of policy objectives and strategies depends on internal and external factors affecting a given country. The most common objectives to be achieved through fisheries development are: increase of food supply for the local population; foreign exchange earnings; increase or maintaining of employment and income levels of fishermen; conservation of fisheries resources; regional development; etc. In order to achieve these objectives, a set of strategies have to be built up. As it was mentioned before, there are alternative means to attain the objectives. Some of those options are presented in the next paragraphs.

Production for National vs. International Markets

One of the dilemmas for developing countries is whether priority should be given to the export or internal markets. Earning of foreign exchange in order to develop the industrial sector or increase protein intake and level of employment of the local population are not necessarily exclusive alternatives. However, very often, production for export, as opposed to production for internal markets, is more capital-intensive, requires more sophisticated processing and marketing techniques and benefits only a smaller number of fishermen in the industrial sector. In developing countries the choice of a fisheries development policy based on export has profound consequences on the allocation of some scarce factors such as capital, which is often directed only to industrial fishing companies.

International trade in fisheries commodities between developed countries accounts for about two-thirds of world fish exports, but the exports from developing countries increased considerably in the last decade. However, trade barriers in developed countries for higher value-added processed products from developing countries, quality requirements and lack of shipping facilities are indicative of the disadvantages of developing countries vis-a-vis the developed countries. In addition to the increasing trade difficulties, when evaluating the potential benefits a country can derive from exporting fishery products, consideration has also to be given to the needs of importing equipment, packing material and services. These can reduce the net benefit of foreign exchange earnings to a marginal figure. The benefits of exploiting an otherwise unused resource and the creation of employment and its impact on the economy are probably the most important criteria for evaluation of development options, although they often enough take second place after the objective of earning foreign exchange (Labon, 1980).

There is an increasing awareness in many developing countries of the need for self-sufficiency in food production. Export-oriented strategies of agricultural products (ground nuts, sugar, etc.) are one of the factors responsible for the decreasing availability of food and even famine in many developing countries. Very few countries in Africa are entirely self-sufficient in food production and also in Latin America the import of food is increasing. In the context of a shortage of animal protein, the question of transferring fish protein from protein-surplus areas is relevant (Labon, 1980).

As in any other industry, production largely for export is dangerous for a sustained growth since there are too many factors which cannot be controlled by the producers, particularly in developing countries which are usually in a weaker market position. Market and price instability have a stronger impact on the performance of an industry if there is no base on the domestic market which can act as a buffer.

The importance of allocating resources to increase the availability of fish as food to the national protein-deficient population cannot be underestimated. Because of the emphasis on export, some countries have not yet taken seriously into consideration the need to improve marketing infrastructure, particularly in rural areas where most of the poor population live. Fuel and capital saving methods should be investigated and directed to make fish available for local consumption. There is a strong link between an increase of internal consumption and an increase in employment rates (not only in the catch, but in processing and marketing sectors); and between the use of production schemes aimed at a better use of fisheries resources through technological processes adapted to local conditions, and an increased self-sufficiency in food production. In this context, the role of artisanal fisheries which produces mainly for local consumption is relevant.

We are not implying that fish export from developing countries should be minimized but simply that a better balance between export and internal market production should be achieved. A more clearly defined assignment of roles between industrial and artisanal fisheries might help in solving the contradictions between production for export and internal markets.

Trade between developing countries as opposed to trade between developed and developing countries should be increased as recommended by the World Conference on Agrarian Reform and Rural Development (1980). The group of small pelagic species is one of the ocean's resources which presents promising prospects for increased utilization for human consumption. Considerable effort will be required to identify and develop the means of marketing these products, especially in the developing world (Labon, 1980).

For the formulation and implementation of policies and strategies directed to increase the availability of fish as food to local populations, important questions have to be answered such as: how to increase fish consumption in countries where *per caput* intake is

low? How should commercialization be organized in order to reach rural areas which are in need of increased food supply?

Artisanal vs. Industrial Fisheries[1/]

In many developing countries, fisheries consist of a large artisanal sector and a recent modern industrial sector. Despite the enormous socio-economic importance of artisanal fisheries in these countries (Emerson, 1980), which are still responsible for almost half of the world's catch for direct human consumption, it is only in the last few years that national and international organizations have begun to show more concern for this sector. In the process of modernizing their fisheries, some countries decided to subsidize industrial vessels (whether publically or privately owned), without taking into consideration the already existing large artisanal sector. More emphasis was placed on investment in deep sea and commercial fisheries for a number of reasons, among which we can cite:

(a) possibility of obtaining external financing from either a foreign government or an international agency for schemes which involve a high capital input;

(b) facility with which such schemes can be administered because fewer individual vessel owners or fishing companies are involved;

(c) possibility of obtaining temporary services of project managers, expatriate management consultants and skilled technicians for large-scale operation investments such as fishing harbours, processing plants and markets which together offer a solid guarantee for the realization of the commercial venture and the repayment of loans (FAO, 1982).

Because of the increasing costs of operation for larger vessels and violent conflicts between the industrial and artisanal fishermen, some governments began to realize the importance of the so-called traditional fishing sector from which many millions of fishermen's families get their income. Recent studies (Ramos, Verrone and Gallo, 1976; Jarrold and Everett, 1981) have also shown that, for the harvesting of large portions of resources within the 200-mile limit, in many cases smaller boats, operating on a family basis, are more economic than larger and sophisticated vessels.

There are several other factors that have called for a revision of priorities in favour of small-scale fisheries. These include: the new prospects offered to them by the extension of national jurisdiction; the necessity to redistribute national wealth to underprivileged population groups through employment opportunities; the need to directly promote rural development; and the need for a more equitable regional distribution of income.

Artisanal fisheries do not need philanthropical assistance from governments but they do require certain conditions to operate as a productive sector, i.e., more stable prices, appropriate channels to sell their products, improved management methods, etc. It should also be clearly recognized that artisanal fishermen are more suitable than complex industrial fleets for exploiting certain highly productive ecosystems (lagoons, coral reefs, coastal areas), due to their skills, knowledge of the environment and more flexible organization of the production units.

Recently, the number of projects aimed at upgrading small-scale fishery communities has increased. However, most of them aimed only at improving fishing methods (motorization of canoes and the adoption of more effective gears and boats), while neglecting other elements such as improvement of markets, extension services, adequate institutional arrangements to solve conflicts with industrial fisheries, etc. (Emerson, 1980). In this context, the establishment of Community Fisheries Centres, which favour the improvement of artisanal fisheries in an integrated way, is of fundamental importance (Ruckes, 1980).

1/ For the purpose of this paper, fisheries are divided into subsistence, artisanal (small-scale), semi-industrial and industrial. Excluding the subsistence fishing, the other types are commercially-oriented activities. The distinction among artisanal, semi-industrial and industrial fisheries is mainly of scale and production, management and property criteria (family vs. company-based) than of market orientation or an isolated technical characteristic of the boat (such as size)

Artisanal fishermen are receptive to innovations, provided that the proposed changes are in line with their interests and cultural values. Innovations such as new fishing devices, motorization schemes, etc., although often introduced without considering the whole production-commercialization process and, therefore, producing less desirable results, have been adopted by artisanal fishermen. In some cases, a small mechanized, semi-industrial sector has appeared and the previous artisanal economic cycle has been expanded, with fishing in a larger ecological area for new resources and with the gain of larger markets.

The production cycle of traditional artisanal fisheries is usually characterized by low catches, limited fishing range, a certain ecological balance and instability of income. The upgrading of artisanal fisheries involves the expansion of the existing economic system, comprising an increase in production (or revenue) and productivity, extension of fishing areas, extension of marketing network, improved processing methods, keeping resources at a high productive level, avoiding economic wastage and biological overexploitation.

As artisanal fishermen usually exploit fisheries resources in limited ecosystems (estuaries, coastal areas, etc.) sometimes subject to other kinds of use (industrial, recreational purposes) including competition from large-scale industrial fleets for the same resources and markets, management schemes are required. They should aim to harmonize competing uses of resources existing in such ecosystems.

A government option to develop small-scale fisheries has also to be seen in the context of using as much as possible the available labour supply in relation to capital-consuming technologies. To increase employment opportunities and to use the abundant labour force available in coastal areas is usually one of the policy priorities in many developing countries. Being labour intensive, small-scale fisheries are usually more appropriate to give employment to this abundant labour force. Labour-intensive technologies can be used not only in fish catching but also in fish processing, marketing, etc. In this connection, it is often mentioned that, to solve the problem of overfishing and depletion of fish resources, it is necessary to control the entry and/or reduce the number of fishermen. Very often the problem is not on the side of the quantity of labour employed but on the type of capital-intensive destructive technology utilized in the catching process. In this case the control and limitation of certain fishing gears is more important than the control of the number of fishermen. Therefore, the definition of 'fishing effort' is crucial in each situation.

However, it is dangerous to shift from a situation where artisanal fisheries are forgotten to the opposite extreme. In the context of fisheries development which is oriented to national interests and self-reliance, industrial fishing has an important role to play, in particular in the harvesting of certain types of mobile and abundant offshore resources. For this type of fishing a more complex fishing structure should be built. In the same context, joint ventures with foreign fleets and companies and leasing schemes (providing that these transitory arrangements are integrated in a nationally defined development process), may play an important role.

While assuming that in most developing countries there is a need to reinforce the position of the artisanal fisheries, it should be recalled that more has yet to be discovered on the type of changes which are needed in order to improve the performance of the artisanal sector. How is capital (and technology) accumulated in artisanal fisheries? Does it come from the artisanal sector (savings, etc.) or from outside (traders, etc.)? What favourable conditions might have existed to enable this development (marketing structures, local availability of high-price resources, etc.)? Can this process be induced by government policies and strategies? Can this upgraded, modernized fishing sector become a core for fisheries development in developing countries? Which should be the desirable relationship between the artisanal and industrial fisheries sectors?

Local Research vs. Imported Package of Knowledge and Technology

The role of science and technology in the formulation of strategies for fisheries development is of great importance. It is recognized that, in the harvesting process, traditional fisherman in developing countries have accumulated knowledge and have created techniques which fit into the production structure of their societies based on limited production and surplus. The efficiency of their techniques, particularly of passive fishing methods, is better recognized now when costs of production of techniques based on fuel-power have increased dramatically. However, when fish have to be harvested from a broader

environment for a larger market, including more elaborate storage and processing systems, more advanced knowledge and technology might be required.

In most of these cases only developed countries have been in a position to generate and control this type of knowledge and technology. It has been recognized, however, that the exclusive use of externally determined technologies in developing countries has produced meagre results. While machines or equipment may be physically transferable from one country to another under certain conditions, it does not seem that their effectiveness in alien socio-cultural environments can be taken for granted (Mafeje, 1981). In the field of fisheries development, resource research programmes were, to a large extent, similar to those executed in support of large-scale fisheries in advanced countries. For the latter, fisheries research has been concerned mainly with the identification of new exploitable resources, using sophisticated techniques for the determination of their optimum fishing levels; investment analysis was done mainly in regard to the profitability of a single firm; research on boats and fishing techniques was done to improve the performance of the long-distance fleet. Developing countries were called upon to join the research effort on resource evaluation and related issues which were more relevant for foreign fleets. Very often, also, research and technological institutes created in developing countries were a copy of those in developed countries, and their contribution to development of techniques suitable for local conditions were not satisfactory (Troadec, 1982a).

In different UN Conferences on Science and Development, many developing countries have recognized the need to create their own scientific and technological basis in order to meet the existing needs of society. They recognized the necessity for all countries to rely on their own indigenous scientific and technological capacities. It has been found necessary to adopt measures to create, stimulate and promote the demand for indigenous scientific and technological activities and for goods and services containing nationally and regionally developed technologies.

In this context, technologies chosen for fisheries development should be adequate not only with respect to the type and dimension of the resource but to the availability of manpower and food needs of the local population. Energy-saving processes have to be found in order to optimize the use of local resources and to produce low-cost goods readily available to the needy population of the third world countries. Whether these technologies are advanced, intermediate or backward is not very important provided that they fit into the local socio-economic context.

Finally, there is an increased awareness among developing countries that already existing expertise and technology should be shared among themselves. This awareness is crystalized in the Technical Cooperation Among Developing Countries (TCDC) Plan of Action and in the recommendations of the FAO Technical Consultation on Economic Cooperation among Developing Countries in Food and Agriculture (1975), which call for those countries to reinforce their creative capacity to find solutions to their problems in keeping their own aspirations, values and needs.

In broader terms, the World Conference on Agrarian Reform and Rural Development has recommended joint measures in order to expand trade between developing countries as well as to improve conditions of trade for products from rural areas in international markets. It also mentions that scope also exists for greater cooperation in the exchange of knowledge and experience in rural technology, institutional reforms and rural development planning.

The United Nations Conference on Science and Technology (Vienna, 1979) acknowledged that there is a need for action on the part of the developed countries to support and facilitate the internal efforts of developing countries to achieve development through the establishment of indigenous scientific and technological capacities. Such action should be geared toward sharing knowledge and experience and the enhancement of the range of options available to developing countries in the process of achieving their nationally defined development goals.

FAO has an important role to play in the framework of the cooperation between nations on the scientific and technological issues. Technical and economic cooperation between countries may proceed through the FAO sub-regional mechanisms for fisheries development and management, with the possibility of tapping available national and regional expertise as deemed appropriate by each member country or group of countries. National projects in

small-scale fisheries, aquaculture, training, etc., may be assisted and supported. Regionally-oriented projects may be undertaken primarily through technical and economic cooperation between the developing countries using local and regional expertise as much as possible.

Sectoral vs. Inter-Sectoral Oriented Approach

At present, in many developing countries, coastal areas and their living and non-living resources are being utilized through competing economic activities such as industrialization, tourism, fishing, aquaculture, etc. Very often a decision by the government to initiate one specific activity excludes other competing ones. Biologically rich ecosystems, such as lagoons and estuaries, have been depleted by polluting industries and unplanned recreational facilities which lead to the destruction of the mangrove forests, etc.

In many cases national development planners have ignored fisheries, while fisheries planners and administrators failed to evaluate properly the possible relationship between competing economic activities and have taken fisheries only as an isolated economic sector. Because of the interaction between fisheries activities and other potential economic activities in coastal areas, an integrated intersectorial approach is needed. Integrated development of the coastal area involves management schemes (concerning, for instance, urban and industrial activities, lagoons and canals, agriculture, fishing, aquaculture, recreational activities) forming part of a complex structure.

The competence of the authorities responsible for fisheries is naturally restricted to the "fisheries" component of the system, but the harmonious integration of this component within the whole requires the creation of appropriate strategies for area development and the cooperation of professionals from different backgrounds, planners and administrators.

In this context, intersectorial planning could be done at an ecosystem level, taking into account the potential for development of specific ecosystems as well as the basic needs of the local population. Intersectorial planning required horizontal and decentralized institutions capable of solving conflicts between the various economic sectors involved in the utilization of the ecosystem's resources. Needless to say, the participation of the local population, through their social organizations, in this kind of planning process is fundamental.

On the other side, it is known that a large proportion of artisanal fishermen live in rural areas and provide a large amount of animal protein consumed by rural populations. This relationship is particularly relevant for inland fisheries in many developing countries. Many of the artisanal fishermen work also in agriculture or as part-time farmers or occasional wage earners. They are small producers who complement their family income through combined economic activities. There is also a certain degree of mobility of a seasonal character of labour from fisheries/agriculture and vice versa and there is a need for an integrated approach to rural development. This integrated pattern of rural development can also be achieved through activities such as aquaculture which can bring in an additional source of income for the rural producers. Aquaculture already plays an important role in complementing protein supply in rural areas, in particular in the Asian Continent. The potential for increased aquaculture production from brackish and inland waters is considered high in many developing countries. It would also improve the employment conditions in rural areas and incorporate, through productive activity, some small-scale fishermen who might be forced to leave overexploited fisheries.

Research on labour-intensive and fossil-energy saving methods could be applied for both agricultural and fisheries products (dried fish, corn, vegetables, etc.). The integration of small-scale fisheries in rural development schemes might help in breaking the isolation of small-scale fishermen, introducing at the same time relevant issues of particular importance to small producers, as stated in the report of the World Conference on Agrarian Reform and Rural Development, i.e., community control over natural resources, reduction of inequalities, people's participation in the development process, integration of women, access to inputs, market services, training and extension facilities, etc. (FAO, 1979a).

Many of the above-mentioned concepts and considerations still raise questions that have to be answered, such as: how to render operational concepts such as ecosystem development in order to cope with different physical, biological and socio-cultural situations prevailing in coastal areas of developing countries. How can fisheries development be integrated effectively in an overall strategy of national and rural development? Under what

conditions could positive experiences of agro-marine communities in integrated development schemes be duplicated? What is the role of funding agencies, both national and international, in this process? Finally, to what extent is technical assistance provided by international organizations relevant in the creation of a sound technological basis for self-sustained fisheries development?

Other Issues

There are many other issues concerning policies and strategies that have not been discussed in this paper. These include issues such as the role of the government and private sectors in fisheries development; the role of fisheries development planning; subsidies; etc. all of which deserve special attention during the Expert Consultation.

SUMMARY AND CONCLUSIONS

There is a growing awareness among a number of developing countries that fisheries development models conceived and implemented in the past few decades are ill-matched to local conditions. Some of them were uncritically transposed from the industrialized nations where high technology and capital are abundant. Insufficient attention had been given to the assessment of the local conditions and to the potential, as well as to the constraints, for fisheries development. As a consequence, the performance of the fisheries sector in many countries has been unsatisfactory.

In the last few years some important changes have occurred that call for a review of past policies and strategies for fisheries development, particularly in developing countries. The continuing fuel crisis, the growing indebtedness of many third world countries, the shortage of food supply for a growing population, the waste and mismanagement of natural resources both in land and sea are factors which call for a new approach to the utilization of renewable natural resources.

The aquatic environment and its resources, when properly managed, can contribute to the solution of many crucial problems which societies, particularly in developing countries, are facing at present. They can, therefore, be the basis for the development of numerous communities which live from the living resources of inland waters and marine ecosystems.

For many countries the establishment of the Exclusive Economic Zone may represent unique opportunity to rethink their policies and strategies for fisheries development.

It is not possible to prescribe fisheries development policies and strategies which would apply to all the situations in developing countries. The development process has to take into account political, social and natural characteristics of the country and even from regions within the country. Fisheries development, however, will be strongly determined by the availability and type of natural resource existing in the coastal States, as well as the needs of the population, particularly those directly involved in the fisheries sector.

In view of the deteriorating economic situation of most developing countries, and in the food supply in particular, strategies and policies for fisheries development should be given more priority to meet the basic needs of the population in those countries They should be based on technologies adjusted to the particular conditions of those countries, to the different aquatic ecosystems inside developing countries, and avoid overexploitation, waste and misuse of natural resources.

It is encouraging to notice that some governmental and intergovernmental bodies, financial and research institutions are taking steps to define directions and give substance for an alternative approach to development. Further efforts are required in order to reap the full benefit from the living resources in the inland waters and marine ecosystems through fuel-saving processes and production systems adapted to the needs of the local population. One of the first steps to achieve it is the formulation of appropriate policies and strategies for fisheries development. This process should not be a technocratic one but should call for the participation of those who live from the harvest of the sea.

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SOME CONSIDERATIONS ON STRATEGIES AND POLICIES FOR FISHERIES DEVELOPMENT PRESENTED IN SELECTED CASE STUDIES

Prepared by the Secretariat of the
Expert Consultation on Strategies for
Fisheries Development (With Particular
Reference to Small-Scale Fisheries)

ABSTRACT

Eleven case studies were selected (Brasil, Cuba, Indonesia, Japan, Norway, Peru, Poland, Senegal, Somalia, Sri Lanka and Tanzania), to reflect different ecological, socio-economic and political situations in different continents. This paper compares the data and results given in the studies and draws conclusions for general consideration as regards such matters as: (a) the public versus the private sector; (b) research; (c) training; (d) infrastructures and institutions; (e) financial and technical assistance (TCDC); and (f) fisheries management. The alternative strategies for management suggested in the eleven studies are then briefly discussed and set out in table form. Conclusions are drawn and fourteen general directives for strategies and policies in fisheries development planning, that are common to most developing countries, are listed. Present strategies for large-scale and small-scale fisheries are discussed in two separate appendixes and a third appendix reviews the impact and problems of foreign aid as experienced in Tanzania.

INTRODUCTION

Little has been written on fisheries development planning. It has a much shorter history than agricultural planning and, therefore, it is difficult to find published material analysing the performance of fisheries development plans. The rapid increase in fish production in recent years, the need to find secure sources of protein for an increasing human population, the long and intense discussions on the jurisdictional aspects of marine resources exploitation, the overfishing of some fish species, particularly in the northern hemisphere, have all raised the need to plan better the use of fish resources at a national level. The need for fisheries planning is also felt by a growing number of national administrations because of the opportunities now available to many coastal States as a result of the new Convention on the Law of the Sea. These coastal countries are realizing that increase in catch by their national fleets will not occur simply because they have extended national jurisdiction over a wider area and to a larger amount of mobile and seasonal resources. In order to take full advantage of additional available resources, developing countries have to devise appropriate strategies and policies. Offshore fisheries require not only heavy investments in boats, equipment and land infrastructure, but a sufficient knowledge of resources available, and skilled labour. As latecomers they can avoid the mistakes made by other countries, such as overinvestment. The present world economic and financial crisis, the high costs of fuel for fishing operations, the increasing protectionism are factors which require special attention when devising fisheries development strategies and policies, particularly by developing countries.

Eleven country case studies were selected in different continents representing wide ecological, socio-economic and political realities. They are Norway, Poland, Brazil, Peru, Cuba, Somalia, Senegal, Tanzania, Indonesia, Sri Lanka and Japan. Some have large fish resources (Japan, Indonesia, Senegal). Others, such as Cuba and Poland, have less sea living resources. Some of them have highly developed industrial fishing (Japan, Poland). Some have a large artisanal sector (Indonesia, Senegal), while others have an incipient fishing sector (Tanzania, Somalia). Some are among the biggest fish consumers in the world, while others such as Somalia have little tradition both in fish eating and catching. Countries like Poland and Cuba have already a tradition in centralized planning, while others such as Indonesia and Brazil have a strong State sector while practising indicative planning. Some governments have specific investment programmes in order to back their

fisheries development plans, while others have only a general statement of objectives for fisheries in their national development plans.

On the basis of the data on the eleven countries as shown in Table 1, fisheries are most important to Senegal, contributing 7.36 percent to GDP, and accounting for 2.2 percent of the actively employed population, 10.2 percent to exports, and 60 percent of domestic protein supply. Fisheries are least important to the economies of Somalia and Brazil. In terms of export earnings, however, fisheries are most important to Peru, Senegal and Norway, and least important to Brazil, Indonesia, Cuba and Sri Lanka. In terms of employment, fisheries are most important to Indonesia, reflecting the labour-intensity of production. Fish is most important in the diet in Indonesia, Senegal, Sri Lanka and Japan, though all countries have other substantial sources of protein.

The data in Table 1 also gives some indication of the priority governments may give to the fisheries sector, and the objectives they may pursue in fisheries development in the future. However, in some countries, large investments have been made in the past, with government subsidies, in supporting privately owned, large-scale and industrial fisheries (notably in Brazil) and, whilst being profitable at an earlier period, these are now underutilized. This is partly due to the hazards of forecasting the state of resources in the future, as well as the difficulty of controlling effort and catch.

The present paper tries to examine the type and magnitude of problems faced by countries in the process of fisheries development. It devotes special attention to developing countries because they have constantly to face the challenges of development and because they are the main concern of an international agency such as FAO.

Fisheries constitute one sector of a national economy in spite of particularities caused by a mobile, variable and renewable resource and an economic activity exercised by a particular socio-cultural group: the fishermen. Like farmers, they have their specific socio-cultural needs.

In this context, fisheries development has to be considered as part of national development defined as: "the constant improvement of the well-being of the entire population on the basis of its full participation in the process of development and a fair distribution of the benefits therefrom. In this perspective, economic growth, productive employment and social equity are fundamental and indivisible elements of development. The international development strategy should, therefore, fully reflect the need for the adoption of adequate and appropriate policies, to be defined by each country within the framework of its development plans and priorities, for movement toward the realization of this ultimate goal of development. The pace of development in the developing countries as a whole should be accelerated substantially in order to enable them to achieve these objectives." (UN/General Assembly A/35/464 of 23.10.80).

Fisheries development is a multi-variable process and in this context, in developing countries, it faces the constraints and challenges of the development process as a whole. As an induced process, it requires appropriate strategies and policies from governments and from the society as a whole.

The small number of cases analysed in this paper prevents wide generalizations but, at the same time, it can provide an idea of the dimension of the opportunities and constraints countries face in the process of developing their fisheries. It is not possible to prescribe a recipe for measures applicable to all countries, however, the analysis of past and present experiences in fisheries development by different countries can help in accumulating knowledge to be used in the future.

Titles and authors of the case studies are listed below:

(1) Fisheries development in Indonesia, by Sunyoto Darmoredjo
(2) The past and present problems of deep-sea fisheries in Poland, by Zbigniew Kasprzyk
(3) La pêche maritime au Sénégal, by Bernard Codou Dioh
(4) La pesqueria Perúana, by Otilio Fernando Chaparro Tejada
(5) Tanzania's experience on fisheries management and development, by G. K. Libaba

Table 1

Basic statistics on fish production in selected countries.

Characteristics / Countries	Size of fisheries resources in EEZ	1980 Production in million tons	Fisheries output in % of GDP (1978)	Destination of Production in %		Size of internal market	Fish as % of total animal protein supply	Proportion of fishermen of economically active population %	Proportion of catches (vol.)		Type of national planning
				Internal market	Export				Industrial %	Artisenal %	
SOUTH/CENTRAL AMERICA											
Peru (FAO, 1979)	large	2.7	1.40	31	69	medium	19.4	0.9	75	25	indicative
Brazil (FAO, 1979)	medium	0.85	0.18	94	6	large	11.5	1.0	50	50	indicative
Cuba (FAO, 1979)	limited	0.18	-	78	22	medium	17.5	0.5	70	30	centralized
ASIA											
Indonesia (FAO, 1978)	large	1.85	2.09	96	4	large	6.36	3.3	10	90	indicative
Japan (FAO, 1978)	large	10.4	0.36	70 (largest importer of fish)	30	large	55.2	0.9	50	50	-
Sri Lanka (FAO, 1978)	medium	0.18	2.08	95	5	medium	54.7	-	10	90	indicative
AFRICA											
Senegal (FAO, 1977)	medium	0.35	7.36	82	18	small	60.5	2.2	21	79	indicative
Somalia (FAO, 1978)	large	0.001	-	20	80	small	0.5	1.7	51	49	centralized
Tanzania (FAO, 1978)	medium	0.24	1.36	95	5	medium	27.7	2.1	5	95	centralized
EUROPE											
Norway (FAO, 1978)	large	2.4	1.33	6.0	94	large	15.3	1.8	-	-	indicative
Poland (FAO, 1976)	limited	0.64	-	80 (importer of fish meal)	20	large	11.8	0.1	-	-	centralized

Sources: FAO Fishery Country Profiles
FAO Yearbook of Fishery Statistics, 1980

(6) Fisheries strategies and policies in Sri Lanka, by Claude Fernando
(7) Somalia's fisheries, by Jan M. Haakonsen
(8) Fishery policy in Norway - experiences from the period 1920-82, by Bjørn S. Brochmann
(9) El desarrollo pesquero Cubano: experiencias y perspectivas, by A. Mena Millar
(10) Brasil, algunas consideraciones sobre la actividad pesquera en el país, by Raul Ximenes Galvao
(11) The experience of Japan in identifying and implementing fishery development policies and strategies, by Satoshi Moriya.

OBJECTIVES FOR FISHERIES DEVELOPMENT

Table 2 shows the objectives for fisheries development as stated in specific development plans, or in national development plans, concerning the fisheries sector.

Table 2

Objectives for fisheries development

Countries / Objectives	Asia			Latin America			Africa			Europe		No.
	Indonesia	Sri Lanka	Japan	Peru	Cuba	Brazil	Tanzania	Senegal	Somalia	Norway	Poland	
1. Increase fish consumption	x	x	x	-	x	x	x	x	x	-	x	9
2. Increase fish production a/	x		x	x	-	x		-	x	-	x	6
3. Raise income/ living conditions of fishermen	x	x	x	-	x	-		-	x	-	-	5
4. Foreign exchange	x	-	-	x	x	x	x	x	x	-	x	8
5. Better utilization of fish resources/ resources conservation	x	-	-			-		x	-	x	-	3
6. Develop/sustain vigorous fishing sector	-	-	x	x		-		x	-	-	-	3
7. Develop scientific/ technological research	-	-	-	x		-		-	-	-	-	1
8. Preservation of settlement pattern of fishermen along the coast (regional development)	-	-	-	-	-	-	-	-	-	x	-	1

a/ Most of the countries mentioned increase in fish production either as an objective or strategy.

The order in the Table does not imply necessarily a ranking of priorities among objectives. Out of eleven countries, nine stressed that increase in fish consumption is an important objective for fisheries development. Increase in fish production appears only in six of the eleven countries. It should be said, however, that some countries considered increases in fish production as a strategy to increase fish supply and consumption by local populations and not as an objective *per se*. In this case, increase in fish supply would be part of the strategy for fisheries development. Foreign exchange has been mentioned as an objective by eight countries, while increase in employment opportunities is an objective for six countries. To raise income and living conditions of fishermen is mentioned by five countries. Better utilization of fisheries resources and establishment of a vigorous fisheries sector is mentioned by three countries. Development of scientific and technological research and preservation of a settlement pattern of fishermen's villages are mentioned once as objectives but, in fact, they are elements of a strategy.

In the determination of objectives in most of the case studies, it is not possible to perceive any priorities among the objectives. However, in the description of the strategies there are some indications of the importance of each objective and how potentially conflicting objectives, such as to increase fish supply for the internal market and for export, can be harmonized. With the exception of a few cases (Somalia, Poland, Cuba), no clear indications exist on quantified targets to be achieved in terms of increase of fish production.

OPPORTUNITIES AND CONSTRAINTS FOR FISHERIES DEVELOPMENT

Opportunities

Opportunities for fisheries development, particularly through increases in output, are determined by the amount of fish resources available. In this connection, two different situations have appeared as a result of the extension of national jurisdiction over marine resources. With the establishment of Exclusive Economic Zones (EEZ) up to 200 mi, some of the countries in this analysis (Poland, Cuba and Japan) lost free access to resources now under national control of coastal countries.

Potential effects of extended jurisdiction on countries under analysis

Potential losers	Potential gainers	
	Major	Minor
Poland	Senegal	Sri Lanka
Japan	Brazil	Norway
Cuba	Indonesia	
	Peru	
	Somalia	
	Tanzania	

In the case studies of Poland, Cuba and Japan, the strategies suggested, in order to maintain the previous level of total output, include:

(1) efforts to increase agreements with coastal countries in order to continue having access to zones now under jurisdiction of coastal countries (Japan, Poland, Cuba);

(2) better utilization of fish resources within 200 mi, particularly of underutilized offshore resources. (Japan has increased its catch of sardines from 420 000 t in 1975 to 760 000 t in 1980. Cuba estimates that it can increase the output of national waters up to 30 percent of the present level. Poland wants to fully utilize resources in the Baltic Sea under its jurisdiction.);

(3) increase harvesting resources outside economic zones (squids, pelagic fish, etc.) (Poland);

(4) improvement of coastal fishing grounds through the establishment of artificial reefs, habitats for clams and shrimps protected from pollution, repopulation of coastal areas, etc. (Japan);

(5) increase output from aquaculture and continental waters (Cuba, Japan).

For the countries under analysis which benefit from the new jurisdiction, the opportunities for increasing output depend mainly on the resources available in their waters and on their harvesting, processing and marketing capacities. Some of them, such as Indonesia, Peru and Senegal and, on a minor scale, Brazil, Somalia and Tanzania, can probably increase their present output. The constraints to any increase in fish production for these coastal countries are discussed below.

Constraints

Table 3 gives an idea of the number and type of constraints found in the case studies which hinder fishery development. These constraints vary from country to country, depending on the amount of their natural resources, social and economic structures, level of national development, etc.

In global terms, the constraints most frequently mentioned are:

(i)	increase in fuel and operational costs	(7 times)
(ii)	inadequate information on fish resources	(5 times)
(iii)	lack of appropriate fisheries development institutions	(5 times)
(iv)	lack of appropriate marketing infrastructure	(5 times)
(v)	isolation and lack of services in fishermen communities	(5 times)
(vi)	lack of skilled labour	(4 times)
(vii)	lack of appropriate technology in catching and processing	(4 times)
(viii)	reduction in fish resources, depletion, pollution	(4 times)
(ix)	conflicts among groups of fishermen, types of fisheries, etc.	(4 times)
(x)	limited financial resources	(3 times)

The constraints mentioned in Table 3 have to be overcome in order to allow fisheries development to take place. Generally speaking, these constraints are interlinked but, in order to achieve specific objectives, specific constraints have to be overcome. For instance, in order to increase output from fisheries (assuming that natural resources are available), the main obstacles to be overcome would be: inadequate information on fish resources (No.5), limited financial resources (No.2), increase in fishing operational costs (No.6), lack of skilled labour (No.7), insufficient productive capacity (No.8), lack of appropriate technology (No.16), lack of planning (No.18), lack of experience in promoting aquaculture (No.26), etc.

In order to increase fish supply to local populations, the following constraints have to be overcome: lack of appropriate marketing infrastructure (No.1), difficulties in changing consumers' taste (No.12), low fish consumption (No.15), increase in fish prices compared with other sources of protein (No.25), etc.

In order to increase income and living conditions of fishermen, the following obstacles should be removed: conflicts among fishermen (No.3), lack of appropriate institutions (No.4), lack of skilled labour (No.7), reduction in fish resources (No.13), isolation of fishermen communities (No.21) and lack of socio-economic infrastructure (No.21), lack of appropriate technology in fish catching and processing and difficulties with engine and equipment maintenance (No.16), etc.

PRESENT STRATEGIES FOR FISHERIES DEVELOPMENT

Given the potential and opportunities, the Government has to devise strategies in order to achieve fisheries development. A single strategy or a set of strategies might be necessary to achieve one or several fishing development objectives. In general, there are different ways to achieve an objective, and strategies have to be consistent amongst themselves. Strategies may be changed, particularly in view of the general orientation given to the economy as a whole.

Table 3

Constraints to fisheries development

	Countries / Constraints	Indonesia	Sri Lanka	Japan	Peru	Cuba	Brazil	Tanzania	Senegal	Somalia	Norway	Poland	total
1.	Lack of appropriate marketing infra-structure/mechanisms	x					x	x	x	x			5
2.	Limited financial resources	x	x					x					3
3.	Conflicts among types of fisheries, groups of fishermen, with foreign fleets	x	x						x			x	4
4.	Lack of appropriate organizational set-up, institutions, poor management	x			x		x	x		x			5
5.	Inadequate information on fish resources	x	x				x	x		x			5
6.	Increase in fuel/operational costs		x	x			x	x	x	x		x	7
7.	Lack of skilled personnel		x	x				x		x			4
8.	Insufficient productive capacity (shipyards, related industries such as boat- and net building, cold chain,etc.)		x					x					2
9.	Conflicting use of coastal areas		x		x		x						3
10.	Inadequate foreign assistance		x					x		x			3
11.	Reduced access to previously open-access resources due changes in sea jurisdiction			x		x						x	3
12.	Difficulties in changing consumers' taste, in introducing new fish products			x	x								2
13.	Reduction in fish resources,depletion				x	x	x				x		4
14.	Over investment/over capacity				x		x				x		3
15.	Low fish consumption				x					x			2
16.	Lack of appropriate technology in fish catching,processing; difficulties in engine and equipment maintenance				x		x	x		x			4
17.	Limited resources in national waters					x							1
18.	Lack of planning, project preparation, appropriate organizations, goals				x		x	x			x		4
19.	Constant changes in policies, strategies,etc.		x		x						x		3
20.	Difficulties in using foreign invest-ment (through joint ventures, licensing schemes) under favourable conditions		x	x		x		x				x	5
21.	Isolation of fishermen communities, lack of social services				x		x	x		x	x		5
22.	Aging fleet								x				5
23.	Lack of appropriate legislation on fishing management									x			1
24.	Inadequate development incentives		x		x		x				x		4
25.	Increase in fish prices compared with other sources of protein			x								x	2
26.	Lack of experience in promoting aquaculture	x	x		x								3

In two case studies, Sri Lanka and Somalia (and to a certain extent Peru), there were recent changes in the overall strategy for fisheries development. In both cases the Government's role, which was a primary one in past administrations, has been limited to the provision of infrastructure, institutional and financial support, while the private sector is expected to play a major role.

An articulated strategy has to define, *inter alia*:

The role of the Government and of the private sector (in a market or mixed economy).

In centrally planned economies such as Cuba and Poland, the role of the State is fundamental in determining growth and income distribution measures. This is normally done through a national development plan in which fisheries represent a sector. Through the plan, the output is distributed according to certain priorities such as local consumption and export. Means of production (boats, nets, labour) are also distributed to different types of fishing (coastal, offshore), using different production structures. In the case of Poland and Cuba, deep sea fishing and part of the offshore fishing are carried out through State enterprises. The State owns the means of production. This sector is generally highly capital-intensive. Coastal fishing is generally done through cooperatives which own boats, equipment, etc. Finally, there are independent fishermen who operate in coastal and fresh water, being owners of the means of production.

In the majority of the case studies, a market economy exists and both the State and private sector operate the fisheries. In mixed economies the role of governments is usually crucial and they intervene in a great or small degree in the fisheries sector through a set of policy instruments (fiscal, credit, research policies, etc.). In countries such as Sri Lanka, Peru, Brazil and Norway, there are specific fisheries development plans and in Indonesia, Tanzania, Senegal and Somalia, fisheries are treated as a sector in national development plans. In both cases, basic choices and decisions are made in the plan, indicating general strategies to be used to accomplish the objectives as well as the corresponding policy instruments. In very few fisheries development plans are the strategies and policy instruments clearly stated. In some countries such as Tanzania, Somalia and Indonesia, there are State-owned fishing companies operating with private or foreign-owned fleets. Indonesia devised a strategy called NES (Nucleus State-Small Holder) through which large-scale State-owned enterprises provide assistance (marketing, boat maintenance) to small-scale fishermen. Due to changes in the overall political and economic orientation, countries such as Peru and Sri Lanka have gradually passed the State control of their fleet to private investors, while keeping control over marketing infrastructure. Other countries with mixed economies such as Brazil, have State control over a large portion of fish landing structures. Most of the case studies give only indications of the general lines which governments have selected to develop their fisheries.

In order to achieve the objective of increased fish production, some governments have adopted policies of technological innovations applied particularly to the fish-catching sector (Indonesia, Sri Lanka, Japan, Cuba, Brazil, Senegal, Somalia). In general terms, particularly in developing countries, technological improvements in boats, nets and fishing methods were directed to increase fishing productivity. From the information available in the case studies, they were of mixed success. Countries such as Japan, Norway, Poland, Cuba and Senegal were able to increase productivity through technological improvements. It should be said, however, that in these cases, technological innovations were not the only factors responsible for this production increase. Reinforcement of institutions both at the Government and at fishermen level are also explanatory factors. Some other countries have had less success in increasing production through technological innovations. Somalia and Brazil, on different scales, are in this category. Among the reasons given for the meagre results are: insufficient knowledge of fish resources, inadequate imported technology, lack of maintenance of engines and gears (particularly in Somalia), lack of skilled labour, lack of institutional support, inappropriate external assistance (Somalia).

Regarding the orientation of the production, it can be said that the strategies of some countries are more directed to supplying the needs of the internal market than others. Japan, Poland, Cuba and Indonesia are apparently more concerned with increasing the food supply to the local populations, while Peru, Brazil, Norway and Somalia are more directed to exports. Some countries, such as Indonesia, have adopted a strategy through which

internal markets are supplied primarily by the small-scale fisheries sector, while international markets are primarily supplied by the industrial sector.

Countries pursuing strategies of maintaining or increasing employment opportunities and fishermen's incomes have been facing conflicting situations among the artisanal and industrial fishing sectors. These conflicts have been aggravated by the oil crisis which, in some cases, forced boats from the industrial fleets to operate closer to the areas traditionally exploited by artisanal fishermen. Four case studies mention this kind of conflict and in one case (Indonesia) trawlers were banned from coastal areas. The most common strategy to solve this problem is to delimit fishing zones for small-scale fishermen into which industrial vessels cannot enter (Indonesia, Poland, Sri Lanka). Some countries (Indonesia, Sri Lanka) have mentioned a strategy of dividing their EEZ waters into areas to be utilized by different types of fisheries and fishermen: inland and coastal areas would be reserved for small-scale fisheries; offshore waters would be reserved for national industrial fishing companies, either State or privately owned; deep-sea waters in which harvesting would be carried out through a combination of local and foreign enterprises, while consideration was being given to equipping local companies to fish there in the future (Sri Lanka).

On the other hand, in order to increase the income of artisanal fishermen, some countries follow the strategy of offering incentives to small-scale fishermen to move to offshore fishing through provision of credit, infrastructure facilities, etc. (Indonesia, Senegal). Several countries mention the need to use labour-intensive (as opposed to capital-intensive) techniques for fish catching and processing as a means of solving increasing unemployment in coastal areas (Peru, Brazil, Sri Lanka).[1/]

Research

Research and technology were identified in various country case studies as fundamental components of strategies for fisheries development. The case studies of Brazil, Peru and Japan point to the need for research to be directed to development rather than for merely academic purposes. Stock evaluation, socio-economic issues, appropriate technologies and new fish products were emphasized as important fields of research. In some countries, such as Peru, in spite of the large numbers of researchers in the fisheries area, it was observed that the use and impact of accumulated knowledge was rather limited. In some case studies (Brazil, Peru) lack of appropriate policies for research (i.e., indicating fields of priority), was mentioned.

Training and Extension Work

Training and extension are indicated as important components of policies for fisheries development by Tanzania, Senegal, Somalia, Indonesia and Peru. The subjects and fields of training are mentioned in the case studies under the item "Technical Assistance and Technical Cooperation among Developing Countries". Opportunities for training will be treated below.

Build-up of Infrastructure

The enlargements of internal markets for fish supply was considered an important element in strategies for fisheries development by a number of countries (Brazil, Peru, Cuba, Japan, Senegal). Five countries have identified the lack of appropriate infrastructure for transportation and fish marketing as one of the most crucial constraints to fisheries development. Countries such as Senegal, Peru and Brazil emphasize the need to reinforce harbour and transportation systems in order to allow the fish to reach markets out of the coastal areas. In this connection, Senegal has a programme for creating regional secondary fishing harbours with cold storage and ice plant facilities in order to ameliorate fish distribution. Brazil is also building a network of regional fishing harbours. The lack of infrastructure facilities, thus isolating artisanal communities, is still a bottleneck for the development of small-scale fisheries in many countries.

Institutional Organization

Lack of appropriate institutional arrangements was considered by five countries (Indonesia, Peru, Brazil, Tanzania and Somalia) as one of the major constraints to be

1/ A more detailed analysis of strategies for coastal and offshore fishing is made in Appendixes 1 and 2

overcome. Considerable efforts have been undertaken to create fishermen's organizations directed not only to increasing production but also to facilitating the provision of physical and social infrastructure for fishermen. Tanzania has applied the concept of "Ujamaa", aiming at self-sufficiency of small-scale fishermen villages, particularly in inland waters. Somalia has made efforts to settle 15 000 nomads, hit by drought in 1974, into fishing villages. Lack of incentives for production, continuous dependence on free food rations, equipment and fuel, lack of repair parts and maintenance, and cultural constraints may explain the limited achievements in Somalia.

Six countries have promoted the creation of cooperatives but, with the exception of Japan, Cuba and Norway where these fishermen's associations achieved positive results, it was impossible to assess the usefulness of these experiences in the remaining countries.

The case studies of Peru, Brazil, Tanzania and Somalia point to the need for reinforcing Government fisheries administrations through adequate training, appropriate remuneration levels and better coordination with other Government institutions, particularly at the planning level.

Financial Assistance and Investment Programmes

One of the crucial elements of a strategy or strategies and policies for fisheries development is the way in which governments allocate financial resources in order to stimulate production, to produce scientific information, to train labour, to transfer technology, etc. This function is even more important in situations in which governments have some control over the economic activities. This is particularly the case in centralized and mixed economies. In order to implement a strategy or strategies, governments use a series of policy instruments such as credit, subsidies, financial incentives, taxation or detaxation. Indirectly, governments may also use price policies (fixed, minimum prices), fuel and export subsidies, etc. The investment programmes or specific credit systems are appropriate indicators for assessing the real priorities given by governments to the fisheries sector as a whole and also to productive sectors within fisheries (artisanal, industrial fisheries). Unfortunately, only five case studies (Sri Lanka, Senegal, Norway, Indonesia and Japan) give some indications on financial assistance and investment policies. Indonesia has several types of credit systems for small-scale fishermen and fish farmers (small investment, working capital credit, mini-credit). Subsidies are given for fuel, fishing materials, fertilizers and pesticides. Due to communication and distribution constraints, however, the subsidized prices are not always felt throughout the country. The case study of Norway indicates the difficulties of eliminating subsidies once they have been created, even if it could be argued that inappropriate incentives may harm the sector in the long run.

Fisheries Management

Out of the eleven case studies, four mention problems relating to diminishing stocks, five mention constraints imposed by insufficient information on fish resources, and four mention problems of conflicting uses of coastal areas and types of fishing. Strategies to solve these problems have varied from country to country. Appropriate management of natural resources became even more crucial for those countries, which, before the establishment of EEZs, were primarily dependent on their long-distance fleets but have now also decided to fully utilize resources in their own national waters (Japan, Cuba and Poland).

Indonesia pointed out the need for area management in order to solve conflicts arising from the use of coastal areas by different and often competing economic activities such as coastal industries, housing industry, aquaculture, etc. The Brazilian case study stressed the need to devise appropriate strategies to manage fertile coastal ecosystems, such as mangroves, estuaries and lagoons, in view of the devastating characteristics of capital and hard technology industries recently located in coastal areas. Similar concern is shown in the case studies of Sri Lanka and Peru. Establishment of specific zones for artisanal fisheries are mentioned by Senegal, Indonesia and Poland.

External Assistance/TCDC

The case studies of Sri Lanka, Tanzania, Somalia and Peru mention that external assistance for fisheries development programmes are useful and valid only when they are

appropriate to the social, economic and cultural conditions existing in the recipient countries. Cuba points out that external technical assistance for developing countries is meaningful only when those countries have a defined policy for national development. Peru stressed the shortcomings of external assistance conditioned to the purchase of technology from donor countries which is often inadequate for the local environment. The Tanzanian case study stressed that development aid can be meaningfully utilized only if it is geared toward what local economy and skills can absorb. It also presented a useful analysis of the development aid to that country. Due to the importance of the issue, a summary of its findings is given in Appendix 3. In the case of Sri Lanka, it is emphasized that more local experts should be used in external assistance programmes due to their knowledge of local conditions.

Considerable interest was shown by developing countries in the process of the transfer of technology and knowledge. It was also mentioned that training could be undertaken under the TCDC umbrella. Japan, Cuba and Poland are ready to cooperate with other countries in different fields of catching and processing technologies and research.

Table 4 lists some fields where cooperation among developing countries might be needed.

Those countries which have resources within their EEZ, and for the moment have no adequate fishing capabilities to harvest them, have discussed ways of financial and technical cooperation with countries possessing long-distance fleets. Some of them (Sri Lanka, Tanzania, Somalia) mentioned joint ventures, licensing of boats, etc. Sri Lanka pointed out difficulties in establishing joint ventures due to conflicting interests of partners on part of production to supply internal markets versus part directed to export. In the case of Tanzania, some joint-venture experiences proved to be unprofitable after six months of operation or failed because of insufficient information on the size of the resource, distribution and suitable technology. In the case study of Senegal, it is noted that the present agreements with foreign fleets would tend to have less importance in the future inasmuch as the capability of the Senegalese fishing fleet would improve.

Indonesia, Senegal and Tanzania endorsed the need for cooperation among neighbouring countries concerning shared stocks, monitoring, control and surveillance of measures in order to manage properly these resources.

ALTERNATIVE STRATEGIES FOR FISHERIES DEVELOPMENT

In view of external factors presently affecting the fisheries sector and its development prospectives (increases in fuel costs, cost of fishing and fishing equipment, generalized protectionism, non-tariff trade barriers jeopardizing exports from developing countries) as well as internal factors (increasing difficulties in feeding growing populations, in securing employment in coastal rural areas, new policies and strategies for fisheries development, are required. For the majority of the analyzed countries, the establishment of Exclusive Economic Zones offers new opportunities for development strategies to be directed to the fulfilment of needs of local populations and of the overall national development.

It is clear that, to take advantage of the new opportunities, strategies should be devised according to the potential and constraints existing in each country.

Table 5 shows the ideas put forward by the authors of the different case studies. Aquaculture and inland fisheries were mentioned by six countries as an important part of a strategy to increase fish production, fishermen's and farmers' incomes and employment opportunities (Indonesia, Sri Lanka, Japan, Peru, Brazil, Cuba and Norway). Development of small-scale fisheries was considered as an important element of alternative strategies in six case studies (Sri Lanka, Japan, Indonesia, Peru, Brazil, Tanzania). Provision of marketing infrastructure and basic social services to fishermen's villages were mentioned as key elements to develop artisnal fisheries. Better utilization of resources in national offshore waters was mentioned as an element for alternative strategies by four countries, particularly those countries with long-distance fishing fleets which lost free access to coastal countries. Appropriate technology, particularly fuel-saving technologies, for fish catching, processing and marketing was mentioned by several countries. Research, particularly on fish species not yet well known and accepted by consumers, was mentioned in four case studies (Japan, Peru, Norway, Poland). Ways and means to devise more appropriate mechanisms for joint ventures were pointed out in four case studies (Japan, Peru, Cuba and Tanzania).

Table 4

Fields of cooperation among developing countries in fisheries development

	Indonesia	Sri Lanka	Japan	Peru	Cuba	Brazil	Tanzania	Norway	Poland
For resource research	x	x				x	x		
Appropriate technology (fishing methods, processing)	x	x		x		x	x		
Training manpower	x			x			x		
Extension service development	x			x			x		
Feasibility studies	x								
Management of shared stocks	x								
Control, monitoring and surveillance	x	x					x		
EEZ management	x	x			x				
Local expertise		x					x		
Aquaculture		x		x					
Human consumption studies		x							
Joint venture negotiations							x		
Research on fish processing				x					
Fisheries development planning			x						

Need for training was mentioned by Indonesia, Sri Lanka, Peru and Tanzania in different fields (resource assessment, appropriate technology in fish catching and processing, fisheries development planning and management).

FISHERIES DEVELOPMENT PLANNING

Few countries in the case studies have had, until recently, coherent fisheries plans, although efforts have been made to integrate fisheries planning in the overall national economic planning. Of the eleven case studies, Sri Lanka, Peru and Brazil have specific fisheries development plans and in Indonesia, Cuba, Tanzania, Senegal, Somalia and Poland fisheries plans constitute a part of the national development plans. In most of the case studies, although strategies were described, there is insufficient information on policies and policy instruments selected to implement the strategies. As a consequence, in many case studies it is difficult to assess how potentially conflicting strategies and policies could be harmonized. Although in many case studies it was stated that the planning of the fisheries sector was integrated in the overall national development plans, few indications exist on how this integration was effectively done and how potentially conflicting strategies and policies for industry, agriculture and fisheries could be harmonized. Indonesia, Tanzania and Sri Lanka emphasized the need to integrate small-scale fisheries projects in rural development schemes, but it is necessary to devise ways and means to implement this approach.

At a national level, it appears that, in general, many difficulties have appeared in the implementation phase of plans. Three major causes seem evident. First is the political will of government, which in some countries has altered with a change in political parties in power. This has affected, for example, Sri Lankan fisheries, where a change of emphasis

Table 5

Elements for alternative strategies

Elements for alternative strategies \ Countries	Indonesia	Sri Lanka	Japan	Peru	Cuba	Brazil	Tanzania	Senegal	Somalia	Norway	Poland	Total
1. Accelerate rational utilization of fish resources within EEZ, attracting inshore fishermen to offshore operations	x											1
2. Use of State fisheries enterprises as agent of development	x											
3. Establishment of integrated rural development including fisheries, agriculture, etc. under one co-ordinating body: Area development	x	x					x					3
4. Allocate fish resources (coastal, offshore, deep-sea) to different fishing groups based on more identifiable criteria	x	x									x	3
5. Create new employment opportunities for overcrowded coastal areas (mari-culture, cottage industries, etc.)	x											1
6. Management schemes on a regional basis	x					x						2
7. Effective measures to reduce fuel costs through alternative technologies	x	x	x			x						4
8. Improve inland fisheries and aquaculture as source of income, employment and protein both for farmers and fishermen in the off-season		x	x	x	x	x				x		6
9. Upgrade the skills of fish farmers through appropriate training and extension work				x								1
10. Major reliance on short-term credit to small-scale fishermen	x											1
11. Greater effort should be made to develop small-scale fisheries, providing *inter alia* basic services to the villages, marketing infrastructure	x	x	x	x		x	x					6
12. Better utilization of under-utilized offshore resources under EEZ			x	x	x						x	4
13. Improve natural productivity of coastal fishing grounds through artificial reefs, repopulation			x									1
14. Energy-saving devices for boats and gears		x	x			x						3
15. Research on utilization of non-conventional species for human consumption, adapted to consumers' taste			x	x						x	x	4
16. Specific training programmes of immediate use to fishermen and processors				x								1
17. Ameliorate processing, particularly traditional processing technologies for salting and drying fish				x	x							2
18. More appropriate management measures	x	x			x							3
19. Work our sound joint-venture agreements		x	x		x		x					4

on State sector involvement to a private enterprise involvement took place after 1979. In Peru there have been two changes in direction, first with nationalization in 1970 followed by de-nationalization in 1979. In Somalia emphasis changed when the Soviet vessels and influence were withdrawn after 1977.

On the other hand, Cuba has maintained stability since the revolution of 1959 and has, in the period of relative political stability since, managed to successfully build up its fisheries sector under State direction. It has involved fishermen in cooperatives in the small-scale inshore fisheries and in the State enterprise in the offshore and distant water fisheries. The achievements of its determined political will to develop fisheries is well described in the Cuban case study. It should perhaps be noted, however, that prior to the revolution, Cuba had practically no fishing industry and so did not have the constraints of traditional culture to impede the changes it introduced. Such constraints have been found in Sri Lanka, Tanzania, Somalia and Indonesia.

Many countries have mixed State and private enterprise fisheries. The level of State involvement varies. For example, it may have a monopoly in certain technologies or in the exploitation of certain species, e.g., for tuna. Where there are joint ventures involving a foreign partner the agreement can be solely with the State, as in Indonesia. Peru, however has a large State enterprise, Pesca Peru, which operates in competition with the private sector, and this has brought problems of allocation of the use of fish, the State sector demanding a certain scale of operation in order to keep its reduction plants viable. The data provided does not allow an assessment to be made of these different strategies however.

Another reason for the lack of success of fisheries planning has been the lack of cohesion and a certain amount of incompatibility in the policies adopted. Even in Brazil, as reported in the case study, though there is a need to create employment, there is said to be little utilization of labour but an intensive use of capital. Further, opportunities for small-scale fisheries development, particularly in the north, is being lessened by housing and pollution from industrial development along the coast and some thousands of small-scale fishermen are said to be threatened by such developments.

Japan, too, has had problems with pollution control in its coastal fisheries.

A third reason for planning failures has been that many governments have been over-ambitious in their estimation of their administrative abilities, and experience in Indonesia, Sri Lanka, Tanzania and Somalia illustrates this. A bureaucratic structure has been imposed on fisheries which has been not only inefficient but also counter-productive.

The starting point for fisheries development must not only be with the fish resource, but also with the human resource. In developing countries it is now being recognized that it is probably more effective to improve fisheries technology and institutions by respecting the existing fishermen and the technology they have evolved, and to build and improve on them, rather than to impose new, more advanced technologies and expect fishermen to adapt to these quickly. This point was mentioned in the Japanese case study; "It is vital, therefore, to adopt a staged, steady fishery development programme keyed to the nation's physical attributes, nutritional levels, consumer taste and dietary problems as well as the degree of development of distribution channels, processing facilities and other socio-economic infrastructure". Attempts to improve fisheries in Somalia illustrate the failure that results when these are ignored.

The history of fisheries planning to date has illustrated that it is easy to set general broad objectives. It is, however, far more difficult to establish intermediate goals in quantitative terms largely because of the lack of data, both on fish resources and also on manpower, especially the particular attributes of fisheries labour and its responses. Further, there has been the temptation to assume and accept models of growth from outside and to ignore the level of local administrative strength and competence, and its absorptive capacity for handling large sums of money in a highly dispersed industry.

CONCLUSIONS

It would be impossible to prescribe strategies for fisheries development which are meaningful for all countries, given the different situations existing in each country

regarding the availability of natural resources, constraints, national development policies and perspectives. Most countries, however, seem to be aware of the need of integrating fisheries development strategies in the overall strategies for national development, particularly in the context of food production. Planning is recognized as a tool to achieve the development of the fisheries sector and its integration in the overall national development. Conflicts among types of fisheries (artisanal versus industrial) and economic activities in coastal areas (fisheries versus industries, tourism) have been pointed out, and in some case studies efforts by governments were described in order to solve them. In some cases it was felt that policy instruments selected to implement strategies were not appropriate and that more efforts should be made to harmonize policies and strategies that otherwise would be contradictory.

Most of the case studies show a growing awareness of the need for better utilization of the resources now made available under the EEZ and of the opportunities to devise appropriate strategies and policies to fully utilize them.

A number of directives emerged from this study which were fairly common to most of the developing countries. They have a substantial effect on devising appropriate strategies and policies for fisheries development. These are:

(1) the prime importance of increasing supply and consumption of fish and fish products, particularly in those countries which have natural resources and an urgent need to feed a growing population;

(2) connected with this is the expansion of internal markets by improved infrastructure, roads and communication;

(3) the need to make full use of available marine and inland fish resources without endangering their renewability;

(4) the need to integrate aquaculture in fisheries development strategies, particularly in relation to rural development programmes benefitting the rural poor;

(5) the importance of solving conflicts that might appear between types of fisheries, economic activities in coastal areas. In this context there is a need to define properly the roles and relationship between small-scale and industrial fisheries;

(6) the increasing emphasis on small-scale industry because of its employment effects and other socio-economic benefits. Included in this must be small-scale processing and preparation for the market, using energy-saving methods, which could provide employment for women;

(7) reduction of post-harvest losses which will lead to an immediate increase in fish supply to the market;

(8) development should be gradual and subsidies applied, where necessary, with fine tuning, to avoid overexpansion of the industry;

(9) the search for energy economies involves the use of more labour-intensive techniques and the better utilization of existing catches. TCDC provides a useful means of communicating these techniques;

(10) fundamental improvements are needed in government administration and implementation capacities in some countries;

(11) increased financial and technical assistance is needed for developing countries, but it should be geared to what local economy and skills can assimilate;

(12) improved market access to fish and fish products from developing countries;

(13) foreign aid must be given with greatly improved pre-investment preparation and appraisal, better administration and follow-up;

(14) technical cooperation among developing countries needs to be improved and accelerated, particularly in the fields of technical assistance, research on resource identification, shared stocks, appropriate technology, training and management schemes;

(15) FAO can be a catalyst in the provision of technical assistance and training;

(16) need to work out sound joint venture agreements.

APPENDIX 1

Present Strategies for Large-Scale Fisheries

The problems facing countries which now have diminished access to fish resources (Japan, Norway, Cuba and Poland) are fourfold: firstly, how to slim down labour and the stock of vessels without causing too much hardship to fishermen; secondly, how to develop mutually beneficial agreements with coastal States with resources they are unable to fully exploit themselves; thirdly, how to search for new resources, and fourthly, how to introduce energy-saving technology. The actions being taken by Japan (described below) are instructive in this regard.

(a) Development of coastal fisheries around Japan. Coastal fisheries are changing from a 'hunting' fishery to a "cultivating and rearing fishery" by fostering aquaculture and creating artificial reefs and beaches and by developing seed production techniques.

(b) By entering into various forms of access agreement with those coastal States which are unable to utilize their resources by their own fishing efforts. Apart from a purely commercial transaction, such as a licence fee, Japan has various forms of assistance to offer, including research, training, technical cooperation and advice. By 1980 Government aid reached ¥ 7.5 billion, and private aid ¥ 4.5 billion.

(c) A reduction of fishing effort is being pursued. Since 1976, 1 600 vessels and 13 000 fishermen have been withdrawn. To ameliorate these losses, Government has paid over ¥ 150 billion in compensation for vessels, and a mutual assistance programme has been developed by which fishermen in employment pay some compensation to those who have lost their jobs.

(d) Measures to save energy are being adopted. It is recommended that the revolutions in the main engine be reduced by 10 percent, thus making a 6 percent fuel saving. Energy saving designs for new vessels are being introduced, which could cut fuel consumption by 20-30 percent. Greater cooperation between vessels and carriers operating on distant fishing grounds has been encouraged to reduce operating costs.

In addition, certain countries, notably Poland, Peru and Japan, are hoping to change consumer tastes into accepting new species for human consumption, some previously used for fish meal. The Polish case study states that blue whiting, horse mackerel, sardinellas, anchovies, massbanker and capelin have not yet been accepted by consumers in spite of introducing new recipes.

Norway introduced a slimming-down scheme in 1979 in order to remove excess capacity. The highly industrialized fleet is being reduced, eliminating 60 of the 250 purse seiners and 14 out of 80 cod trawlers, compensation being paid on the vessels. Poland is slimming down its fleet by withdrawing old vessels and does not intend to replace them for many years, and then by introducing smaller vessels using less energy.

In the case studies a variety of strategies are shown to be in operation with the view of taking full advantage of fish resources now available under the Exclusive Economic Zone.

Sri Lanka, for instance, has a strategy of leaving the harvesting of sea resources in coastal areas to small-scale fishermen; offshore resources would be exploited by local companies and deep-sea resources by arrangements with fleets of other countries (through licensing, joint ventures) and local companies whenever possible.

Indonesia is encouraging its nations to go into deep-sea and offshore fishing by offering subsidies on medium-sized vessels and assistance in marketing, through six State fishing enterprises.

Tanzania, according to the case study, has not yet expanded its fishing to a 200-mi EEZ as it does not have the required infrastructure to support an offshore fishery. It has

however, had three joint ventures, none of which lasted long, largely because of the lack of suitable resources and low profits. It urgently requires research on stock identification through regional cooperation.

Somalia has many problems in handling its substantial resources, largely because its people are not seafaring, do not eat fish, and it has no natural harbours and has not the infrastructure to support an offshore fishery. It has, however, very optimistic plans for the expansion of the trawling fleet and Government aid is high, nearly three and a half times the expenditure in the health sector. However, it seems that plans are unrealistic and the Government institutional framework needs to be reorganized, but how this is to be done is not clear.

Senegal has a large offshore resource presently exploited by joint venture, by foreign vessels under licence, by vessels privately owned solely by Senegalese and by some State-owned vessels. Its planning objectives are to gradually expand Senegalese exploitation and to increase exports of fish for human consumption to other West African States, but it is finding some consumer resistance, and better marketing and processing methods need to be introduced. It is finding competition in these markets from fish landed by more technically advanced large industrial vessels from the USSR, Cuba and Poland.

Whilst the development of small-scale fisheries may be a suitable strategy for catching resources within their access, there are, in many countries, resources which can only be fished by large vessels.

Strategies for development depend to some extent on how important the need is to develop fish for export. Many luxury species which enter international trade are either produced at a cost which is too high for local consumption, e.g., tuna, produced at about US$ 800 to US$ 900 per ton at American ports, or which obtain a much higher price internationally than can be afforded by domestic consumers. Some such fisheries (shrimp, lobster, cephalopods) are in fact small-scale fisheries, providing needed employment and income, as in Indonesia, Senegal and Cuba. The exploitation of luxury species will yield a higher level of income to fishermen as long as the resource is not overfished. In order to maintain this as a source of foreign exchange earning, Government strategy should be directed to securing proper management of stocks by, for instance, controlling effort. Excessive assistance in the form of subsidies to fisheries could be disastrous, as stated in the Norwegian case study.

Few developing countries have the infrastructure to support the large fleet of mechanized vessels needed to exploit the whole EEZ, as illustrated particularly in the case studies of Tanzania and Somalia. However, some middle income countries, illustrated by Peru and Brazil, now have excess capacity due to a fall in fish resources and following a decline from earlier levels. Sri Lanka, on the other hand, built infrastructure in anticipation of the development of offshore resources and the expectation of foreign cooperation, but due to changes in Government policies this did not materialize and the capacity is still underutilized.

The development of large fleets of industrial vessels, as in Peru and Brazil, by private enterprise has been supported by Government funded infrastructure, which, whilst leading to private profit, has probably led to little benefit to the nation as a whole. When, however, such infrastructure has been supported by multinational and international sources, as for instance in Somalia, it would be useful to know what criteria were used for appraisal and whether they were entirely in the interests of the coastal State. In Somalia, for instance, a huge cannery, constructed mostly with Soviet aid, and a freezing complex supplied by the USA, are both now almost stagnant.

In Tanzania and Somalia a modest development, if indicated, should involve cooperation between them and TCDC within the region, with two objectives: that of preventing excess investment and that of securing as many benefits as possible for themselves, as distinct from the foreigner. Furthermore, if the fishery is to be exploited by foreign effort for an overseas market, there must be a net benefit to the coastal State and a net foreign exchange gain, after allowing for the costs of infrastructure and port installations. Also, where export-led growth is pursued as a Government strategy, the net costs in terms of foreign exchange must be assessed, especially if Government is involved in

investing in infrastructure and port facilities. Of course, if such investment has a spin off into the growth of local small-scale fisheries either for the foreign or domestic markets, this could be a considerable benefit, as has arisen in Senegal. In some countries, however, for example in Indonesia, in order to pursue a regional balance it may be desirable to locate export-oriented fisheries in areas where there is comparatively little other fishing activity.

The example of Brazil provides an illustration of the rapid growth of fisheries infrastructure oriented toward the needs of large-scale fishing. Here, privately owned vessels were subsidized by Government loans and the industry became so expanded, that resource became depleted leaving a grossly underutilized infrastructure, idle plant and many bankruptcies.

The disposition of world catches, given in the table below, shows that 30 percent is currently being used for reduction and other non-human food use. The two largest producers of oil, fats and meal from fish are Japan and the USSR, followed by Chile, USA, Peru and Norway. It would be unrealistic to expect reduction to decline as long as it remains the most profitable means of disposal of fish caught in large quantities. However, the higher fuel cost is hitting distant water fleets. The Polish case study shows that Polish deep sea catches in 1981 were obtained from grounds averaging 7 300 mi distant, compared to 2 500 mi in 1970. However, though some of the fish used for reduction is caught by distant water fleets, much is caught by coastal States (Peru for example) which in 1970 caught one half of the world's catch of fish for reduction. This easily accessible resource has a fuel economy not available to Poland. It is unlikely that the cost of fuel will deter for long all distant water fleets, especially where new resources are found and where fish surplus to human demand exists. For example, Poland, according to the case study, 'has mastered the techniques for krill catching and a semi-technical advanced technology for processing it for consumption and for processing into fodder', and advocates the use of specialized fleets 'to act as one single organism' in large-scale fisheries. Further, the high costs of exploratory research involved in the search for new resources and technologies, should, it is said, be shared internationally.

Disposition of World Catch

(total world catch = 100%)

	1976 %	1980 %
For human consumption	68.5	70.0
Marketing fresh	20.1	20.5
Freezing	21.0	21.7
Curing	13.9	13.7
Canning	13.5	14.1
Other purposes	31.5	30.0
Reduction	30.1	28.6
Miscellaneous	1.4	1.4

(Source: Yearbook of Fishery Statistics, Vol. 51, FAO, 1980, Table A1.1)

A number of fish species currently used for meal could be used for human consumption, e.g., blue whiting, bream, pilchards, etc., but demand for them is constrained largely because of limited consumer acceptability. Consumer reluctance is evidenced by the case studies of Poland, Peru, Japan and Senegal. Without substantial expenditure on marketing and the promotion of consumer demand, it is unlikely that demand for human consumption will absorb available supplies. Moreover, it has been noted that (as in Senegal) the industrial fisheries have substantial discards at sea of species that could find acceptance in a consumer market, though the means of getting this to the consumer market has yet to be

explored. Many of the case studies have shown concern with the difficulties of getting consumer acceptance for marine fish (Somalia and Tanzania) or for specific new species (Peru, Poland, Norway and Senegal).

Whilst Senegal may have a limited domestic ability to absorb more fish for human consumption, there are countries in West Africa which could but, as mentioned in the case study, there are problems with marketing and consumer acceptance which have to be overcome first. Thus, one of the dominant strategies for fisheries development must involve the search for new consumer markets for marine fish both internally and internationally. Japan, however, in order to expand the market for fish normally caught for fish meal into the consumer market, especially for sardines and mackerel, has used TV, publications and cookery classes, but no measure of the acceptance of these species is indicated.

A strategy which shifts fish from meal production to human consumption, especially in the poor countries, fulfils a development objective, but some thought must be given before pursuing this strategy to assess the cost of production/protein ratio of other sources of protein, i.e., the opportunity costs of producing protein from vegetable and other animal sources.

Bearing in mind the fact that energy costs in real terms increased by nearly 100 percent between 1973-80, a benefit of the shift away from fish meal production and highly industrialized fisheries to smaller-scale fisheries would be an economy in fuel, though no data on this is given in the case studies. However, whilst fish may, on the coast, be a cheap means of producing protein, it may not be a cheap way of getting protein to the consumer, bearing in mind the processing and marketing costs. Alternative strategies for fisheries development which pursue socio-economic criteria of benefit to the country as a whole must, if production exceeds domestic consumption, be concerned with an examination of the market. If domestic demand is not being met, the initial concern may be to increase the domestic supplies.

An alternative strategy to improving the quality and quantity of fish protein is by improvement of traditional methods of processing and presentation and marketing. If these are, for example, by sun drying or by traditional smoking methods, they may also be energy economizing. Furthermore, there is usually some room for decreasing unit costs of production and increasing the protein value of fish by reducing post-harvest losses. Research results are available on improvements to traditional methods of processing from a variety of sources and there are good opportunities for TCDC, even within CECAF. The traditional methods of preparing fish for the market in Senegal may leave much to be desired in terms of hygiene and post-harvest deterioration, but it is a product which is accepted by consumers and it could be improved with little capital investment, retaining the labour-intensive character of the processing, and at the same time being non-energy intensive.

The development of markets involves not only increased consumer acceptance but improvements in market structures. Marketing constraints have been highlighted for many years. Luna, writing ten years ago and analysing the Latin American regional shortage of protein, stated that one quarter of the deficit amounting to 4 million tons could be provided by fisheries development over a period of five years but, though some traditional problems were being corrected, the lack of marketing had persisted as a major obstacle. Judging from the case studies, little change in this situation seems to have occurred since.

Bottlenecks in developing domestic consumer markets for fish have been enumerated by Diegues as lack of infrastructure, communications, transport, marketing and storage. These present formidable constraints. Substantial marketing and distributive investment may be required but these may not necessarily be specific to fish distribution only but serve a wider number of goods and produce. Such investment must be considered in a long term perspective in line with the development of the economy as a whole.

A second alternative where production exceeds domestic consumption is the development of export markets. Fish exports face competition from other world producers and, for newcomers, it may be in the national interest to subsidize production costs over a short period whilst establishing foreign markets, as could be effective in Senegal. This strategy may be particularly important where fishing technology has to be upgraded to levels involving a period of training and experience for local fishermen which will subsequently lead to an increase in employment and incomes. However, the experience of Norway is instructive. Norwegian fishermen's incomes were increased over a period when there was an export boom but when the boom ended it proved difficult to reduce the level of earnings.

APPENDIX 2

Present Strategies for Small-Scale Fisheries

The importance of small-scale fisheries has been recognized for many years and written into successive development plans, though with fairly ineffective strategies and implementation. The importance of small-scale fisheries to the poor developing countries is obvious from the following table which shows a contribution in most cases of 100 percent to domestic consumption and, with the exception of Somalia, where little fish is consumed and hence the small-scale fisheries sector is small, they contribute very substantially to total fish production. Data for Brazil, a middle-income country, is also given demonstrating the export oriented bias of a country with a much higher level of GDP (1979) 1/at US$ 1 780 compared to an average of approximately US$ 300 for the others.

Relative importance of small-scale fisheries (SSF) in less developed selected countries

Country	Production SSF as % of total	SSF contribution for domestic consumption	Year of data	Per capita GDP 1979 US$
Senegal	79	97	1975	430
Tanzania	100	100	1975	260
Sri Lanka	100	100	1976	230
Indonesia	95	no data probably 100 a/	1982	370
Somalia	30	100	1982	no data
Brazil	50	53	1976	1 780

a/Author's comment

(Source: Mainly extracted from Fishery Development Sector Policy Paper, IBRD, May 1982)

The justifications for emphasis on small-scale development, for instance for socio-political reasons, to maintain rural employment and stability; to curtail the rural-urban drift; to increase rural incomes (as it is here that most poverty is found); to maintain as better regional balance in the economy, etc., are well discussed in the literature 1/. An additional attraction of small-scale fisheries is that they are non-energy intensive. Sri Lanka gives particular incentives to small-scale fisherman who change to using sails or engines of a low horse power.

In many developing countries, strategies for fisheries development started from the assumption that their existing small-scale fisheries could be upgraded to a higher level of incomes and production by the introduction of technically advanced gear and vessels. This has proved a successful strategy in a few countries, for example in West Africa, and indeed is still the policy in Sri Lanka and Indonesia, as the case studies show. However, difficulties in pursuing policies for upgrading, many of them well documented in the literature, for instance failures of loan schemes, cooperatives, changes in marketing, the resistance to change, and the slowness of administering assistance to fishermen in highly dispersed areas of poor communication and roads, etc., have not only proved a serious deterrent to development, but also has proved costly in terms of Government finance and foreign assistance, as shown in Somalia.

1/ a. See Working Paper for South West Indian Ocean Programme Workshop on Small-Scale Fisheries, Seychelles, 1982. FAO, pp. 18, 19
b. Symposium on Small-Scale Fisheries, IPFC, 1980

Upgrading has usually been considered as a means of advancing the industry in terms of efficiency and costs. In Senegal it has been shown, however, that non-motorized canoes are at least as economically viable as the mechanized sector. Furthermore, because of its socio-economic features, viz., high labour intensity, use of energy saving inputs, the development of a fishery by non-mechanized craft may provide an important alternative to upgrading.

The response of small-scale fishermen to technological change has been very varied, and in Indonesia it is suggested that new incentives should be devised to attract inshore fishermen to offshore and even deep sea fishing. The assumption that such upgrading is possible to achieve quickly, even given substantial Government inputs in terms of subsidies, loans and technical assistance, is not valid for all societies, especially where small-scale fisheries have been oriented toward a subsistence ethic of production and may not have the inherent risk-taking and entrepreneurial drive needed to accept and adopt innovations. The evidence for this lies with the very many instances throughout the world of the rapid absorption of Government inputs which have been designed specifically to help the small-scale fishermen, being instead taken up by individuals from outside the industry. On the other hand, in some countries, small-scale fisheries have responded quickly, leading to an overexpansion of effort, for example as in Senegal and Norway. The Norwegian case study warns that it is possible to argue that overcapacity has developed as a result of former generous Government support.

Other perspectives must be recognized:

(1) that for most artisanal fishermen fishing is a part-time occupation and will remain so as long as their technology is devoted to exploiting a resource which is seasonal. Thus the objective of improving fishermen's income needs to be set in the context of their other income-earning employments and the conflict which may arise between these in terms of seasonality of labour input and competing needs for capital.

(2) that small-scale fisheries largely involve rural occupations and to prevent rural-urban drift a whole package of social inputs may be needed to improve the quality of life (health care, water supplies, etc.).

(3) that in early stages of development such as still exists in Sri Lanka, Tanzania, Somalia, and Indonesia, the predominant concern amongst artisanal fishermen is probably for increased security rather than increased income. This could indicate a strategy which gave support to agricultural production, which fitted into the requirements of the seasonal labour input of the fishing industry, and could be appropriate for example in aquaculture. However, such integrated rural planning could easily involve an overburdening degree of bureaucracy and the attempts to develop Somalia settlements illustrates how easy it is for participants to develop a dependency syndrome.

It would be a mistake, however, to embark on a consideration of development strategies for small-scale fisheries without an honest examination of earlier mistakes, and analysis of the reasons for failure and the particular socio-political environment which provided a framework for their collapse. Hopefully, sufficient exists in FAO literature about such failures to prevent similar instances reoccurring. The current emphasis on community development which encompasses fisheries has emerged from these failures. It is an approach which starts by considering the community and not by imposing upon it alien institutions and culture.

The Norwegian study warns against using income subsidies, since 'in the long run it will inevitably have important negative effects'. 'The causal chain between subsidizing income and the growing fishing effort has become evident. It is, in fact, possible to argue that the overcapacity partly has developed as a result of former generous Government support'.

APPENDIX 3

Impact and Problems of Foreign Aid

(From: Tanzania's Experience on Fisheries Management and Development by G.K. Libaba)

Development aid can be meaningfully utilized if it is geared toward what the local economy and skills can support. In this respect, the technology involved should be appropriate to the prevailing situation in the recipient country and, as far as possible, independent of continuous foreign exchange requirements.

The continuity of fisheries projects can be guaranteed if easy availability of spare parts and skills to run and maintain the machinery is incorporated in the project at the planning stage.

(1) Experience gathered indicates that most projects do not take into account the technical and environmental capability of the project to continue after the expiry of foreign participation. Projects dependent on imported spare parts and skills collapse as soon as foreign participation ceases. Good planning for continuous operation of a foreign-aided project should:

   (a) provide an alternative source of spare parts;
   (b) guarantee that all foreign components of the project can continue to be available after the expiry of foreign participation;
   (c) develop local skills and motivation for the trained personnel to remain on the job.

(2) Foreign-aided projects get limited financial support after foreign participation ceases. This limits the operational activities of the project.

(3) Lack of experienced management staff committed to the continuous operation of the project.

(4) Delays in completing major components of the project resulting in projects expiring, leaving behind uncompleted project components and no plans to have them completed.

   The FAO/UNDP project expired before the pilot fish farm was established. The ducks and fish fingerlings also arrived after project expiry, depriving them of the full attention they would have received if they had arrived within the project time schedule.

(5) Lack of local commitments to continue supporting foreign-aided projects after stoppage of foreign participation. This is seriously noticed with capital-intensive projects.

(6) Introducing very complicated technology which continues to demand foreign exchange support.

BRASIL, ALGUNAS CONSIDERACIONES SOBRE LA ACTIVIDAD PESQUERA EN EL PAIS
ESTUDIO DEL CASO

por

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RESUMEN

Partiendo del macromodelo de desarrollo económico adoptado por el país en las dos últimas décadas y que busca el aumento del PNB, a través de la superación de tres límites: del capital, de la mano de obra y de la balanza de pagos, el presente trabajo intenta mostrar la inconsecuencia de las políticas sectoriales adoptadas por el Gobierno, entre ellas la política de pesca.

Destaca que, a pesar de las tipologías factoriales y los procesos de producción adoptados por el sector pesquero y que, en nada difieren de toda la actividad económica desarrollada en Brasil, crea distorsiones, tanto por parte de la oferta como por parte de la demanda.

Por parte de la oferta de ocupación, pequeña utilización de mano de obra, utilización intensiva de capital, y uso intensivo de los recursos naturales; y en la oferta de bienes y servicios, la adopción de procesos productivos que buscan, principalmente, el atendimiento de la demanda externa.

Por parte de la demanda, el no entendimiento de las necesidades de empleo de la mano de obra y la persistencia de escasez alimenticia de la mayor parte de la población brasileña, especialmente de proteínas de origen animal.

Siendo esto así, la capitalización del sector pesquero nacional, la concentración de la actividad de procesamiento industrial en el centro del país, depende mucho más de resultados de una política económica global, que dé meros instrumentos de política financiera, como es el caso de los incentivos fiscales y del FISET/PESCA.

A partir de ahí, se describen las actividades pesqueras desarrolladas en la faja litoránea, principalmente, en los litorales sur, nordeste y norte de Brasil; y en cuencas hidrográficas, con énfasis especial en la cuenca amazónica.

La ocupación irracional del espacio físico brasileño, en escala y ritmo jamás vistos y como consecuencia de grandes proyectos impactos, se describe, dando énfasis a los procesos de degradación, deterioración del medio ambiente, contaminaciones y poluciones que ponen en riesgo la continuidad de la pesca en el país.

Estuarios, lagunas, mangues, entre los ecosistemas marinos, de gran importancia en la generación de producción primaria están siendo terraplenados por proyectos de habitación, tipo PROMORAR, o destinados a la instalación de plantas industriales de tecnología dura, como es el caso del Polo Petroquímico de Sergipe y del Polo Míner-Metalúrgico de São Luis do Maranhão, donde una única unidad de procesamiento de aluminio de ALCOA que empleará 2 000 obreros, puede inviabilizar una pesca artesanal, hasta ahora desarrollada por cerca de 65 000 pescadores artesanales. En el primero de los Rolos, localizado en la región de Aracajú, en el año 1983 entrará en funcionamiento una unidad de procesamiento de cloreto de potasio que generará 1,3 millones de toneladas/mes de cloreto de sodio que serán lanzadas directamente al mar y que, solamente por los efectos de la tensión osmótica podrá poner en peligro la cosecha, con altos índices de productividad del cangrejo Uça (*Ucides cordatus*) y que representa actividad que genera renta para cerca de 35 000 personas.

Además de eso, áreas litoráneas del norte y del sur del país están siendo destinadas para bases de misiles (Alcántara-MA); fábricas de cohetes (Ubatuba-SP); y centrales nucleares (Angra dos Reis-RJ e Iguape-SP).

Añádase a esa ocupación irracional la especulación inmobiliaria que aleja de las fajas litoráneas grandes contingentes de pescadores artesanales; además de destruir dunas y vegetaciones de las orlas marinas.

En el caso de las cuencas hidrográficas, los desmatamientos con su influencia deletérea sobre el ciclo del agua, la contaminación de ríos por el lanzamiento de detritos urbanos, industriales y agrícolas ya están conduciendo a un término fatal e instantáneo, la pesca de aguas interiores.

Y juntamente con la degradación del medio ambiente, dilapidación de los recursos naturales y un consumismo desenfrenado, va desapareciendo la figura del pescador, expropiado, expoliado y sin la necesaria movilidad social que permita incorporarlo como proletario, a las nuevas relaciones de producción de una pesca moderna, en su mayor parte, ejecutada por embarcaciones de pabellón extranjero, o por barcos con bandera nacional, pero incorporados a actividades externas, a través del mecanismo de formación de las "joint-ventures".

Y a todo eso es insensible la tecnoburocracia dominante.

Principalmente, cuando sujeta SUDEPE a un Ministerio de Agricultura, unidad de fomento a la producción, a través de tecnología importada y, a su vez, también inadecuada a las condiciones de suelo y microclimáticas del país.

De ahí la sugestión final, basada en una filosofía de gestión ambiental, de la creación de un Ministerio de Recursos Naturales y Medio Ambiente que, dentro de un plan de ordenación, delinease, con el concurso de las comunidades un plan para el sector de pesca.

Las políticas y estrategias definidas en este trabajo difieren muy poco de las propuestas por SUDEPE - Superintendencia para el Desarrollo de la Pesca. Estas, mientras tanto, se caracterizan por contradicciones no resueltas satisfactoriamente.

1. CONSIDERACIONES GENERALES

1.1 Potencial Pesquero

Entre las profundidades de 0 a 199 m, la biomasa total de peces demersales para todo el litoral brasileño varía entre 1 116 000 a 1 572 000 t. De este total se considera que el mayor volumen capturable es de aproximadamente el 50 % de la biomasa calculada, sin daños a la conservación del equilibrio biológico de las reservas.

La mayor biomasa de peces demersales se encuentra en las regiones norte y sur, variando de 494 000 a 715 000 t y de 409 000 a 567 000 t respectivamente.

En lo que se refiere a los recursos pelágicos, el potencial capturable se cifra en torno a 900 000 t, encontrándose tales recursos más concentrados entre el litoral de las regiones sureste y sur.

Por eso se estima que la producción pesquera de recursos marinos y de estuario, a través de la pesca extractiva, podrá como máximo doblar los actuales niveles de producción (800 000 t), alcanzando volúmenes de captura entre 1 400 y 1 700 t, siempre que se exploren solamente las áreas comprendidas entre las isóbatas de 0 a 200 m, sin riesgo para la disponibilidad de las reservas.

En lo que se refiere a aguas interiores, el mayor potencial se concentra en la cuenca amazónica, que comprende un gran número de ríos, depresiones, igarapés, lagos y lagunas marginales, bastante distintos entre sí, consideradas ciertas cualidades físicas y químicas de esos ambientes.

En términos de cuantificación, el potencial pesquero de la cuenca amazónica todavía no es suficientemente conocido. Las estimaciones existentes son bastante contradictorias. La más cierta, sin embargo, es la que fija la producción máxima de pescado para la región amazónica en 100 000 t. Siendo esto así, se concluye que la producción de pescado de aquella región ya alcanzó o está alcanzando niveles máximos, ya que en 1975, fueron capturadas allí 105 000 t de pescado.

Otras cuencas, tales como, las del Plata, Paraná, Río Grande, Río Pardo, Mogi-Guaçú y São Francisco, en otro tiempo abundantes, vienen presentando sensibles disminuciones de productividad pesquera, como consecuencia de inumerables factores, entre los cuales están: la construcción de grandes presas, desmatamientos ciliares, polución agrícola y urbano-industrial y la manipulación impropia de tales ecosistemas.

En lo que se refiere a reservas de agua, la explotación racional de 400 grandes presas, así como de pequeños y medios embalses a nivel de propiedades agrícolas, podrá proporcionar beneficios económicos y sociales para el país, principalmente para las regiones menos abastecidas de proteínas animales.

En el registro general de las grandes presas, concretamente en los "Planos Estatales de Desarrollo de la Pesca - 1980/85", se estima que pueden existir cerca de 3 millones de hectáreas inundadas por las grandes represas públicas, además de los pequeños y medios embalses ya mencionados y a nivel de propiedades privadas y muchos lagos existentes, que podrán ser usados para piscicultura.

En lo que se refiere a la maricultura, en las costas brasileñas con una amplitud de 8 000 km de extensión, la actividad presenta grandes potencialidades. Sin embargo, no existe una infraestructura física de soporte a la actividad, además de preceptos institucionales, constituyéndose también en factor limitativo de la actividad, la ocupación irracional de los estuarios, a lo largo de las costas brasileñas.

1.2 Mano de Obra Ocupada

Se estima que 600 000 trabajadores están vinculados directamente a la actividad pesquera. De estos, 400 000 son pescadores, entre los cuales el 95 % son artesanales; los 200 000 restantes se dedican a actividades complementarias a la pesca. En el cómputo general, cerca de 3 millones de personas dependen directa o indirectamente de la pesca.

1.3 Producción Pesquera en el País

La tasa media de crecimiento en el período de 1968/77 fue del 5,2 % abajo de la tasa de crecimiento medio del sector agropecuario. Cerca de 800 000 t de producto fueron capturadas al final del período.

Las regiones sur y sureste fueron las que participaron con mayor índice en la producción, durante el período, con una media del 63 % de la producción total.

La región nordeste viene participando menos en la producción nacional de pescado. Su participación media en el período fue del 23 % manteniéndose tal producción estabilizada a partir de 1973, con el 21 % del total desembarcado en el país.

La región norte, poseedora de un gran potencial, presente, sin embargo, una participación pequeña en la producción del país.

No obstante, se viene verificando un sensible incremento de producción en los últimos años del período de 1968/77 como consecuencia de las capturas realizadas por las flotas del Pará y Amazonas.

En el centro-oeste, principalmente representado por el estado de Mato Grosso, la producción de pescado originaria de aguas interiores, viene presentando una participación poco significativa en la producción nacional de pescado, en el período considerado, o sea, cerca del 0,33 % del total.

Y toda esa producción es oriunda casi exclusivamente del sistema de pesca extractiva en agua marina, estuariana e interior. La participación media de la producción de la pesca en aguas marinas y estuarianas, en el período analizado, fue, según la "Estadística de Pesca 1968/77" de la SUDEPE/IBGE, del 80 % manteniéndose estable esta participación en años más recientes.

También, según la misma publicación, el pescado de aguas interiores, con una participación media del 20 % del desembarque total, presentó un índice de crecimiento en 1977, superior al de origen marino y estuariano, así como al de la producción nacional.

Para la realización de esa producción, la pesca artesanal participó tradicionalmente con el mayor porcentaje de capturas en el país.

A partir de 1968, como consecuencia de los incentivos fiscales, esa participación declinó, en términos absolutos y relativos, a una tasa anual del orden del 5,9 % y 5,4 % respectivamente.

Mientras tanto, la pesca artesanal ostenta el liderazgo en la captura de especies para el mercado interno, tanto para el consumo humano directo, como para la industria del pescado.

La pesca industrial se viene concentrando en la pesca marina. En los últimos años, la captura conseguida por empresas de pesca viene creciendo a razón del 5 % al año. Y en las regiones sur y sureste están localizadas casi todas las industrias de pesca del país. En esas regiones se encuentra cerca del 67 % de la capacidad instalada en cámaras.

Según datos del DIPIS/DNOCS de 1977, relativos a acuicultura, se destacan en la producción: la pesca del piauí, la tilapia, el camarón, la traira, el curimatá y el tucunaré, cuya participación llega al 80 % del total producido. Se estima que la producción total de la acuicultura en el país fue en el período de 1977/78 de 22 000 a 23 000 t aproximadamente; y según los mismos estudios del DNOCS, la productividad media de los embalses es de cerca de 110 kg/ha/año de pescado, considerada una de las más elevadas del mundo.

En lo que se refiere a peces ornamentales, su captura se restringe a la región norte, siendo el volumen actual de la producción de 12 a 14 millones de unidades capturadas de las cuales el 92 % fueron exportadas. Esto, según el informe de la misión sobre peces ornamentales FAO/SUDEPE, 1978.

1.4 Proceso Productivo

El diagnóstico del IV Plan Nacional de Desarrollo de la Pesca 1980/85 destaca que la producción pesquera en Brasil se origina de dos sistemas productivos: la pesca extractiva, constituida por pesca artesanal e industrial, y el cultivo o acuicultura.

Y basándose en datos recogidos durante el I Encuentro Nacional de Pesca, realizado en 1978 por SUDEPE, la pesca artesanal se realiza normalmente en aguas costeras y estuarianas, extendiéndose por aguas interiores. De acuerdo con los "Planos Estatales de Desarrollo de la Pesca - 1980/85" se estima que el contingente de pescadores artesanales se sitúa entre 380 000 y 400 000 pescadores profesionales.

En cuanto a la pesca industrial, el mismo documento, basándose en Sodré y Azevedo (1975), afirma que la misma es prácticada, sobre todo, en aguas costeras y oceánicas y en aguas estuarianas, con la utilización de embarcaciones superiores a 20 TB de arqueo y mediante el empleo de tecnología más desarrollada.

Dice además que cerca de 2 000 empresas operan en el sector, en el área de captura, industrialización y comercialización, constituyéndose de pequeñas, medias y grandes empresas, de las cuales 250 son de tamaño medio.

El parque industrial pesquero cuenta con 326 empresas procesadoras de pescado que, según la "Serie Documentos Técnicos N° 20 POP/SUDEPE, 1976, desarrollan actividades que varían entre el simple enfriamiento hasta los métodos más sofisticados de transformación.

Sin embargo, el diagnóstico del PNDP _ "Impacto del Costo del Combustible en el Sector de Pesca de 1975" ya apuntaba serias dificultades enfrentadas por el sector industrial como consecuencia del precio del combustible que contribuía con el porcentual del 30 al 60 % del costo total de operación de captura; y con la falta de informaciones concretas sobre las zonas de existencia de las especies.

2. MODELOS A TRES LIMITES

Un modelo de crecimiento de la economía brasileña, es el período de 1967/80.

En el año 1967, al formular un plan de desarrollo a largo plazo, el Gobierno brasileño adoptó, para determinar el producto nacional y su crecimiento en cada año del período, un modelo a tres límites. En este caso, los tres límites básicos que influyen en el crecimiento de una economía son:

(a) de capital,
(b) de mano de obra, y
(c) balance de pagos.

Para efectos de esta monografía, presentaré, en resumen, el modelo desarrollado por Kerstenetzky (1968) y Simonsen (1968).

Designando por:

P = Producto nacional — ΔP = Variación anual del producto nacional

N = Población activa — ΔN = Variación anual de la población activa

C = Capacidad de importación — ΔC = Variación anual de la capacidad de importación

Se sigue que:

$$\frac{\Delta P}{P}, \quad \frac{\Delta N}{N}, \quad \frac{\Delta C}{C}$$

serán, respectivamente, las tasas anuales de crecimiento del producto nacional, de la población activa y de la capacidad de importación.

Designando, asimismo, por:

I = Volumen anual de inversión

$\frac{I}{P}$ = Tasa de inversión — $\frac{\Delta P}{I}$ = Relación producto/capital

$P = \frac{P}{N}$ = la productividad del trabajador nacional

$\frac{\Delta P}{P}$ = la tasa de crecimiento anual de esta productividad

$K = \frac{C}{P}$ = el coeficiente de importaciones

$\frac{dK}{K}$ = la tasa de variación anual del coeficiente de importaciones

se sigue por deducciones matemáticas elementales que:

(1) $\frac{\Delta P}{P} = \frac{P}{I} \cdot \frac{I}{P}$

(2) $\frac{\Delta P}{P} = \frac{\Delta N}{N} + \frac{\Delta P}{P}$

(3) $\frac{\Delta P}{P} = \frac{\Delta C}{C} - \frac{\Delta K}{K}$

Conocido como modelo de los tres límites, que proporciona el límite del capital (función 1), el límite de la mano de obra (función 2) y el límite de la balanza de pagos (función 3).

De ellos se pueden extraer las siguientes líneas de política adoptadas por el Gobierno brasileño en las últimas décadas:

(a) límite del capital: crecimiento del producto a partir del crecimiento de la razón producto/capital; o por el crecimiento de la tasa de inversión;

(b) límite de la mano de obra: elección de procesos más intensivos en mano de obra, mediante el aumento de la población económicamente activa, reduciendo el desempleo disfrazado; o programa de aumento de la productividad de la mano de obra, mediante extensión o educación; y

(c) límite de balanza de pagos: donde se pueden distinguir dos estrategias del Gobierno brasileño, antes y después de 1964. La primera, que se extendió principalmente en la segunda mitad de la década del 50, o sea, reducción del coeficiente de importaciones, mediante un proceso de substitución de importaciones; y la segunda, que pasó a ser adoptada después de 1964, en el caso, crecimiento de la capacidad de importar, mediante el aumento de las exportaciones.

Tal modelo, insistentemente empleado por todos los Gobiernos brasileños en los últimos 18 años, trae consigo profundos cambios en las relaciones de producción de todos los sectores económicos del país, principalmente aquellos más tradicionales, como es el caso del sector pesquero.

Para superar los límites descritos, se adoptan tipologías factoriales intensivas en capital; extensivas en mano de obra; intensivas en el uso de los recursos naturales y del medio ambiente; en síntesis, generadoras de impactos económicos, sociales y ambientales.

Los procesos de producción, la oferta de ocupación y las tecnologías empleadas, han conducido a una creciente acumulación del capital, con la consiguiente concentración de la renta; concentración de la actividad; expropiación, expoliación y depauperización de grandes contingentes poblacionales, principalmente, de los estratos más pobres y dedicados a las actividades agrícolas y de explotación de los recursos naturales. Tales fenómenos se hacen acompañar de aumentos en la frontera agrícola, a escala y ritmo incontrolables; y en la incorporación de nuevas áreas de tierra por las actividades económicas, principalmente, las localizadas en la faja litoraleña.

La llamada al ahorro externo viene facilitando la entrada de capital extranjero y la desnacionalización de la economía, en los días actuales es controlada, en buena parte, por empresas multinacionales.

Como parte considerable de la producción está dirigida al atendimiento de la demanda externa, buena parte de las inversiones industriales se localizan junto a regiones lagunares y estuarianas que, por un lado, ofrecen agua industrial de cuencas hidrográficas próximas y de otro, permiten la construcción de puertos y terminales de exportación. La concentración de industrias en estas regiones lleva a la valorización del suelo urbano y a la construcción de casas para ejecutivos, técnicos y obreros de plantas industriales, a cuyas funciones se añaden los usos para la construcción de casas secundarias, marinas y playas particulares, lo que hace que, gradualmente, disminuyan las zonas hasta entonces ocupadas por pescadores artesanales.

Después de disertar sobre el macromodelo de desarrollo económico adoptado por Brasil en las dos últimas décadas y que continúa influenciando la actividad pesquera en toda la faja del litoral brasileño, principalmente de la desempeñada por el pescador artesanal, disertaré sobre algunos casos de ocupación irracional de esos espacios, principalmente de los ecosistemas estuarianos y lagunares, cuyos impactos ambientales ya se hacen sentir.

3. OCUPACION IRRACIONAL DEL LITORAL BRASILEÑO

Impactos ambientales consiguientes y previsibles. Diegues (1976, 1979) destaca que: la destrucción de las fuerzas de la naturaleza en ecosistemas extremamente productivos como los lagunares y estuarianos afecta primordialmente a los pequeños pescadores, los cuales, dados los equipamientos relativamente poco predatorios y embarcaciones de pequeña autonomía que usan, obtienen de ahí sus medios de subsistencia. En la medida en que innumerables especies de peces tienen en las lagunas y estuarios su ambiente de reproducción, la sobrepesca ahí ejercida causa una disminución de la productividad global del océano. Habla en seguida de las alteraciones sufridas por esos ecosistemas como consecuencia de manipulaciones agrícolas impropias y de lanzamiento de desechos urbano-industriales que alteran las condiciones físico-químicas y biológicas de esos ambientes. Como ejemplo, menciona, en los diversos trabajos aquí destacados, las Lagunas del Mundaí y los estuarios de Iguape y Cananéia.

Entre tanto, esa polución, esa degradación y esa contaminación de ecosistemas estuariano y lagunares en el país, se han agravado mucho en los últimos años.

El caso extremo de esas degradaciones se encuentra en la zona, antaño abundante en pesca, de la Baixada Santista, en el Estado de São Paulo, como consecuencia del parque industrial de Cubatão, polución que viene ocasionando impactos en las vegetaciones de manglares de Cubatão, principalmente como consecuencia de terraplenes en seis millones de metros cuadrados de manglares donde se pretende instalar 11 000 casas populares que deberán abrigar a los moradores de Vila Parisi, obreros del mencionado parque industrial. Tales vegetaciones de manglares serán exuberantemente ricas, según estudios del Instituto Oceanográfico de la Universidad de São Paulo, encontrándose hoy completamente muertas. Algunas especies resistentes a la polución todavía son consumidas por los moradores del lugar, a pesar de los índices de contaminación por metil mercurio. También la represa Billings contribuye para la polución de la Baixada Santista, puesto que recibe 90 m^3 de desagües de São Paulo que, aumentados a los generados por las industrias de Cubatão, circulan por los ríos Cubatão, Pereguê y Quilonbo, yendo a desembocar en el estuario de Santos, en cuyas playas el índice de coliformes fecales alcanza niveles que corresponden al lanzamiento de desechos humanos de una población de cerca de 90 millones de personas. Se añade a eso, las miles de toneladas/día de agua de lavado de chimeneas de la siderúrgica COSIPA conteniendo óxidos de manganeso y hierro. En el mismo estuario son lanzados por dos unidades de procesamiento de fertilizantes, ULTRAFERTIL y EXFAFER, cerca de 5 000 m^3 de efluentes provenientes de las unidades de procesamiento de ácido nítrico, nitrato de amoníaco y amoníaco. La Companhia de Estireno lanza, como término medio, en el estuario de Santos más de 12 microgramos de mercurio por litro de agua; mientras la legislación federal fija como límite máximo de emisión el correspondiente a 0,1 microgramo de metal para un litro de agua. La industria CARBOCLORO produce cloro, soda y mercurio y despeja hasta 500 m^3/s de agua conteniendo el metal pesado, en el estuario de Santos. Igualmente ALBA-ADRIA Industrias Reunidas lanzan 30 m de agua por hora en el río Pereguê, eso después de la tentativa de purificarlas en cinco lagunas, sin embargo, sin éxito, principalmente en lo que se relaciona con los fenoles, metanol, aldeído fórmico, resinas de poliester y urea-fenol. La industria Manah lanza más de 9 m^3 de agua por día conteniendo cloretos y ácido fluorídrico en el río Moji, agua

ésa que contiene también fertilizantes nitrogenados y fosfatados. Esto es solamente una muestra de la mezcla de poluentes que es lanzada en el estuario de Santos y que ya alcanza a buena parte del litoral sur del Estado de São Paulo, que imposibilita la vida biológica en esos ambientes, así como la propia balneabilidad de sus playas. Hasta el momento no se prohibió el contacto primario de las poblaciones del Estado con esas aguas, debido al desastre económico que ocasionaría a la industria del turismo, principal fuente de renta de la ciudad de Santos y de otros municipios de la Baixada.

En cuanto al estuario de la bahía de Guanabara, su situación no difiere mucho de la encontrada en la región de la Baixada Santista.

Los mismo sucede con la laguna dos Patos, en Río Grande do Sul, lar de reproducción de los enormes bancos de taiñas que pueblan el litoral sur del país.

Las bahías de Iguape y Cananéia, ésta última abrigando la experiencia pionera del cultivo de ostras y un parque, además del Centro de Estudios Aplicados de Recursos naturales de la Secretaría de Agricultura y Abastecimiento del Estado de São Paulo, fueron recientemente designadas para ser sede de plantas nucleares; lo que ya acontece con el estuario de Angra dos Reis, en el estado de Río de Janeiro.

Las bahías de Vitória, en el Estado de Espírito Santo, fueron esterilizadas por el polvo de mineral de hierro embarcado para el exterior en el puerto de Tubarão.

La bahía de Todos os Santos, en el Estado de Bahia, recibe los detritos industriales del Centro industrial de Aratú y del Polo Petroquímico de Camaçari, estando totalmente estéril.

La bahía de Mundaú y la de Manguaba, en el estado de Alagoas, citadas por el Dr Diegues (1976), en que abundaban en gran escala el sururu (*Mytella falcata*), después de la implantación de una unidad de procesamiento de soda cáustica y de la intensificación del plantío de caña de azúcar en sus márgenes, vió desaparecer esa especie de extrema importancia para la alimentación y explotación económica de la población local.

Tal fue el desequilibrio ecológico verificado en esa laguna que, en la última Semana Santa, el Arzobispo local dispensó a los fieles de ayunar con pescado, dado su alto costo en el comercio de Maceió, en gran parte oriundo de otras regiones del país, y del cual, una parte importante está constituida por merluza congelada, pescada en las costas del Uruguay por empresas de pesca del sur del país.

En Aracajú, Estado de Sergipe, en el año 1983 entrará en operación una unidad de procesamiento de cloreto de potasio y que lanzará al mar el correspondiente a 1,3 millones de toneladas/mes de cloreto de sodio. Solamente por tensión osmótica se prevé la desaparición de los manglares allí existentes, la fauna aérea y terrestre abrigada por el ecosistema, además de la fauna acuática constituida por sururus y cangrejos uçá (*Ucides cordatus*), este último bastante importante en la dieta alimenticia local y regional y que da empleo a más de 35 000 personas. Una matriz industrial constituida por varias unidades de producción de productos químicos está prevista para la zona de abarca cerca de 14 municipios del Estado, casi todos en el litoral, donde se desarrolla una productiva actividad de pesca artesanal.

Sin embargo, el caso más flagrante de irracionalidad en la ocupación de zona contigua a un ecosistema lagunar y estuariano, se verifica en la isla de São Luís, escogida por el proyecto Carajás como polo minero-metalúrgico, dada su "vocación metalúrgica". En la isla de São Luís, que se encuentra enclavada en el Golfão Maranhense, constituido por las bahías de São Marcos y São José y que tiene un área de 70 000 ha, estará localizado un polo que ocupará un área de 14 000 ha, o sea, 1/5 de la isla. En él se implantarán: una unidad de semiacabados de acero, para procesar 10 millones de toneladas/año del producto; una de Sinter con capacidad de producción anual de 3 millones de toneladas; una de cock, dimensionada para producir 2 millones de toneladas/año del producto; y otra para producción de 2 millones de toneladas/años de aluminio calcinado y 400 000 toneladas/año de aluminio metálico. Esta última está constituida por el consorcio ALUMAR formado por ALCOA y SHELL. La planta de ALUMAR ocupará un área de 10 000 ha, o sea, 1/7 de la isla de São Luís, área mayor que la ocupada por el centro urbano de São Luís, capital del Estado do Maranhão, de 6 000 ha. La planta ocupa los últimos manantiales de agua potable de la

isla constituidos por los ríos Tibirí, Pedrinhos y dos Cachorros. Depositará anualmente 2 800 000 t de lodo rojo en lagunas de decantación construidas sobre terreno permeable, comprometiendo la napa freática de la isla, donde todas las existencias de agua son consecuencias de manantiales por percolación. Lanzará al aire, con destino final en las aguas del golfo, cerca de 76 t/día de dióxido de azufre, además de los fluoretos, en la fase de reducción del aluminio. Generará solamente 2 000 empleos directos para una inversión de más de un billón de dólares.

ALUMAR y las demás unidades que constituyen el polo minero-metalúrgico de São Luís do Maranhão y que en total, inclusive después de cotejar los empleos indirectos, generarán 38 000 empleos, podrán ocasionar la desaparición de una pesca artesanal, una de las más significativas del país y ejercida por más de 65 000 pescadores artesanales.

La importancia de esa pesca es tan grande que, en el año 1975, aunque no estaba contemplada por el Proyecto BID/FAO, por sugestión mía como contraparte nacional, fue visitada por los "expertos" de las dos organizaciones, siendo entonces escogida como sede del proyecto específico de Pesca artesanal en Brasil.

Mencionada la previsión de impacto, juzgo necesario describir la potencialidad de la pesca regional en el Maranhão, lo que haré sucintamente.

El Estado do Maranhão posee 640 km de costa, la más extensa del país. Su litoral norte está constituido por reentradas de perfil bastante recortado, diferenciándose del litoral nordeste, menos accidentado.

En sus 1 414 km^2 de lagos y lagunas el índice de capturas de pescado es elevado, lo que, aliado con la producción de peces, moluscos y crustáceos del litoral, permite un volumen de pesca de 60 000 t/año. Sin embargo, ese número no refleja la totalidad de capturas realizadas en el Estado, pues, paralelamente a la pequeña flota con sede en Maranhão, existe un considerable esfuerzo de pesca desarrollado por estados vecinos en sus aguas, creyéndose que la producción real alcanzada puede ser del doble de lo indicado. Aquí no se coteja la inmensa flota extranjera que opera en las aguas continentales del Maranhão, en extensión a la pesca del camarón que se extiende desde el estuario del río Amazonas, en el Pará. Cerca de 240 navíos, algunos extranjeros y otros con bandera brasileña, merced el artificio de las "joint-ventures" arrastran camarones en las costas marañaenses, pesca predatoria que da origen a una reyección inconmensurable de "trash-fish" que esporádicamente se aproxima al litoral norte marañaense. Se añade a esto, la pesca de tiburones realizada por barcos japoneses y que después de la captura, extraen el hígado y las barbatanas del pescado, lanzando al mar el resto.

Desarrollada artesanalmente, la pesca en los grandes lagos marañaenses presenta una producción sorprendentemente alta, llegando a alcanzar 25 000 t/año. El producto pescado, compuesto casi exclusivamente por dos especies (branquinha y curimatá) es comercializado en el interior y exportado para otros estados, donde alcanza precios de comercialización compatibles con los de los peces de agua salada.

El Estado do Maranhão posee 640 000 ha de vegetaciones de manguesque, integradas a las reentradas y a sus estuarios y lagunas, que constituyen el "habitat" natural de innumerables especies, así como el lar de reproducción y de alimentación de gran parte de la ictiofauna regional.

En la pesca marañaense se utilizan pertrechos bastante simple, tales como: puça, zangaria y muruada.

A pesar de los desvíos y descargas de peces en otros estados, con todo, el Maranhão se colocó en el primer lugar de producción de pescado de la región nordeste de Brasil.

Stocks potenciales de pargos, pescadas, langostas, tiburones, sierras, camurins, xaréus, sirigados, garoupas, camarones, cangrejos, son algunos de los recursos pesqueros de una disponibilidad prácticamente no aprovechada que, una vez explotada racionalmente podrá colocar al Maranhão entre los tres primeros estados brasileños en la producción pesquera.

En un momento en que los grandes productores mundiales de mejillones sufren una reducción en sus niveles de producción, el Maranhão dispone de un stock natural de explotación sustentable del orden de 30 000 t/año de sururu (*Mytella falcata*). Y, con tecnología y condiciones apropiadas del cultivo, este potencial podrá ser duplicado.

Los cangrejos de la especie (*Ucides cordatus*) presentan un índice de 37 000 individuos/ha, correspondiendo a un potencial de 4,20 t/ha. Tal recurso alcanza relevante importancia si se considera la extensión de la zona de los estuarios.

La pesca del camarón es realizada por artesanos, en el interior de las reentradas e, industrialmente, por barcos camaroneros provenientes del Pará y Ceará que atracan en el Maranhão. Además de eso, hay que tener en cuenta la pesca realizada por barcos extranjeros, ya mencionados en otro lugar de esta monografía.

Las áreas de arrastre son bastante extensas y la pesca se efectúa principalmente en el litoral nordeste del Estado.

Colocado entre los mayores productores de pescado del país, el Maranhão ostenta el primer lugar en la rentabilidad obtenida. Se observó en 1975, por ejemplo, una producción de 49 346 t del Estado de Río de Janeiro, el mayor productor. Sin embargo, su rentabilidad fue de B.Cr. 82 744 para Río, mientras que la pesca marañaense rindió B.Cr. 176 714; esto debido a la excelente calidad de las especies existentes en el litoral marañaense, peces de primera calidad, exportables y de porte medio y grande.

A pesar de ser el Estado más pobre de Brasil, el Maranhão desarrolla un extenso programa de asistencia a la pesca, por intermedio de una Secretaría de Recursos Naturales, Tecnología y Medio Ambiente.

4. IV PLAN NACIONAL DE DESARROLLO DE LA PESCA 1980-85, BRASILIA 1980

Desde el comienzo, el documento deja claro que el actual surgimiento inflacionario, principalmente el que fustiga al país después de 1974, trae consigo restricciones de orden económico-financiero que podrán constituir obstáculos al desarrollo del sector pesquero.

Atribuye al sector la responsabilidad en la solución de problemas relacionados con la crisis energética, mediante alternativas de uso racional de combustible y del empleo alternativo de otras fuentes energéticas, tanto en la fase de producción como en la de distribución del pescado.

A este respecto cabe comentar que todos los proyectos de modernización de la actividad pesquera atribuyen siempre a la motorización de barcos una de las prácticas de extensión llevadas a comunidades artesanales. O mejor, esta fue una observación inicial de un ingeniero de pesca de la Misión BID/FAO en su primer contacto con comunidades de pescadores del litoral norte marañaense. Tales programas, además de contrariar medidas concernientes a la racionalización del uso de la energía, están en conflicto con variables antropológico-culturales y aun ambientales, dado que los veleros, jangadas y saveiros, muchas veces indican verdaderas ecotécnicas, que exigieron esfuerzos de adaptación cultural de comunidades pesqueras al medio en que actúan, durante siglos de actividades. Y la menor productividad obtenida, probablemente sea responsable por una pesca selectiva y que no compromete stocks hasta no bien dimensionados.

El propio proceso de "modernización" acelerada, de acumulación vertiginosa, de un consumismo desenfrenado estimulado por efectos demonstración, a partir de procesos de comunicación de masas y el paso de la pequeña producción para la producción ampliada, hacen que desaparezcan sistemas tradicionales de formación de artesanos capacitados para las tareas de construcción de barcos y de corrales y cercos.

Mencionando la deuda externa brasileña, el Plan de SUDEPE afirma que el sector podrá contribuir para la disminución del deficit comercial, a través del aumento de las exportaciones de pescado; y por la formación de excedentes de stocks de otros tipos de carnes exportables, colocando el pescado en el mercado interno. Se refleja aquí la preocupación de SUDEPE con el límite de la balanza de pagos ya descrito. En realidad, las dos metas, además de no encontrar bases en la realidad del mercado brasileño, son conflictivas. El énfasis a la captura de productos exportables está en conflicto con la producción de pescado para atender la demanda interna.

Al analizar el proceso histórico de la actividad pesquera en el país, muestra que desconoce que el mismo repitió el proceso mundial, es a saber, que la actividad tuvo inicio en una lenta sucesión de pesquerías artesanales, solamente modificadas después de la Segunda Guerra Mundial, por consiguiente, en días bien recientes.

Menciona la edición del Código de Pesca en 1934, la creación de CODEPE en 1961, responsable por la explicitación de una política sectorial, instrumentalizada por mecanismos de extensión fiscal, constituidos por estímulos a la creación de nuevas industrias pesqueras y de la ampliación de la flota existente.

Menciona la creación de SUDEPE en 1962 y la institución de incentivos fiscales en 1967 con miras a la consolidación del parque industrial pesquero del país y cuya reformulación fue consecuencia de la creación del FISET/Pesca.

Aquí cabe comentar que, en gran medida, los problemas enfrentados por pescadores aislados, empresas de pesca y algunas cooperativas que tradicionalmente realizaban la producción sectorial emergen a partir del Decreto-Ley 221 del 28/02/1967.

Desde entonces, se inició el proceso de surgimiento de modernas empresas de pesca (Diegues, 1979) creadas e incentivadas por el mencionado dispositivo jurídico. Personas jurídicas o firmas de sectores a la pesca pudieron aplicar hasta el 25 % del impuesto de renta en la creación o incentivo a las empresas de pesca con la finalidad de crear una industria de base para el sector pesquero nacional.

Como consecuencia de esos estímulos, hasta finales de 1972, SUDEPE había aprobado la utilización de recursos del orden de B.Cr. 1 742 millones (a precios no corregidos), beneficiando a 137 empresas de los cuales B.Cr. 1 191 millones eran incentivos fiscales y B.Cr. 551 millones, en contrapartida, en recursos propios.

Dada la importancia fundamental de esa intervención del Estado en el proceso de acumulación empresarial-capitalista, hizo que (Diegues, 1979) se dedicase un capítulo especial a la misma.

Tal política provocó sensibles modificaciones en la organización de la pesca brasileña. Empresas creadas gracias a los incentivos, pasaron a poner en práctica programas de: construcción e importación de barcos en gran escala; equipos de infraestructura de tierra, todo dirigido a una pesca costera que, de forma general, no alcanzaba más allá de la plataforma continental. "El número de barcos por encima de 20 TB en el puerto de Santos pasó de 18 unidades en 1950 a 324 en 1976. Fenómeno idéntico ocurrió en Río de Janeiro donde los barcos por encima de 20 t pasaron de 40 unidades en 1950 a 202 en 1976" (Diegues, 1979).

Eso llevó a un aumento de la actividad pesquera para empresas beneficiadas y a una concentración de la actividad en el sur del país.

La concentración de los medios de producción en el sur/sureste de Brasil y que recibió el 97 % de los incentivos, no modificó, sin embargo su producción desembarcada, elevada al 24 % del total del país en el nordeste que recibió sólo 0,3 % de incentivos.

Esta capitalización y adopción de procesos productivos dirigidos a la oferta de productos exportables, están conformes con el modelo de desarrollo adoptado por Brasil en las dos últimas décadas.

En el año 1975, las empresas creadas artificialmente por los incentivos constantes del Decreto-Ley 221 daban señales de insolvencia. Esto provocó la creación del FISET/Pesca, para el "saneamiento" de empresas. De esta forma se promovieron fusiones de empresas fallidas, incorporaciones de otras a empresas tradicionales, evidenciando en los días actuales errores de la política gubernamental relacionados con el área pesquera.

Al referirse a la maricultura, el plan menciona la extensión de la costa brasileña y sus potencialidades, además de mencionar los estuarios como merecedores de una atención especial y que deberán constituirse en punto de partida para cualquier iniciativa que se adopte con miras al desarrollo de la acuicultura.

En este punto, el órgano máximo de gestión de los recursos y de la actividad pesquera del país, debería profundizar sus consideraciones, delimitando zonas exclusivas de maricultura, destinadas a especies adaptables. Deberías, asimismo, establecer una legislación de protección a tales áreas; fijar áreas de vulnerabilidad en puntos específicos del litoral; establecer usos y aptitudes de ensenadas, golfos, restingas, mar abierto, estuarios, lagunas, manglares, etc. Todo esto debería formar parte del plan de SUDEPE. Mucho más que la falta de infraestructura física, a que hace mención el plan de SUDEPE, tales medidas con las que se están constituyendo en factores impeditivos de la expansión, así como de mantenimiento de algunas actividades aisladas de maricultura en Brasil.

En el capítulo referente a la pesca marina y estuariana, el IV PNDP da énfasis a la "baja productividad del pescador artesanal" y a su falta de capacitación; presentando tales puntos como responsables de la ineficacia de los mismos en sus zonas de pesca. Conclusión engañosa, puesto que enmascara el proceso de reproducción y acumulación del capital, incentivado por el Gobierno a partir de medidas de política económico-financiera que benefician solamente al capital, privilegiando costos/beneficios económicos, en detrimento de iguales coeficientes sociales y ambientales.

Sobre la pesca inferior, hay otra afirmación bien poco fundamentada y distante de la realidad concreta: "el nivel de especialización de la mano de obra no es importante, puesto que el sector incorpora excedentes de la actividad agropecuaria". Nada más incorrecto. La pesca como se ejecuta en la cuenca amazónica exige profundo conocimiento del ambiente y de todo el ecosistema, entrenamiento que es incorporado por relaciones culturales profundas, y manejo de variables impuestas por las condiciones específicas ecológicas de la región y de la cuenca. Y, durante el período de un año que estudié la pesca en la Amazonía occidental, me fue dado a conocer que muy pocos son los pescadores de la región capaces de asociar su actividad de pesca con la agricultura, esta última desempeñada por mujeres y muchachas. De otro modo, tal hecho encuentra un componente de explicación antropológico-cultural en el indigena predominante en aquella parte del país.

Sobre la necesidad de entrenamiento de la mano de obra para la piscicultura, algunas experiencias, como las de la ostreicultura en Cananéia, y de piscicultura en Alcântara, demuestran que los mismos no necesitan de entrenamientos intensivos, ya que son fácilmente asimilables por los pescadores.

El IV PNDP se refiere a la infraestructura portuaria que está necesitando un control mayor. Su administración por empresas de economía mixta, sea nacional como es el caso de CIBRAZEM, sea estatal, como es el caso de CEAGESP en São Paulo, obedece a modelo de descentralización administrativa y a la búsqueda de ganancia como principal finalidad, siendo la rentabilidad y la eficiencia las metas de esas empresas, todo de acuerdo con el macromodelo de desarrollo nacional, no de acuerdo con la descapitalizada empresa pesquera de Brasil.

El entrepuesto de pesca de la CEAGESP en Cananéia, entre otras cosas, aumentó el 1 000 % al costo de un bloque de hielo suministrado a los barcos que hacen uso de él, en menos de 10 años. Ahora bien, en el armado de los barcos que operan allí tal producto tiene un sensible peso en el costo. Camaroneros de pequeño y medio porte, de 9 a 12 m de longitud, y que realizan de 4 a 5 viajes mensuales, gastan en cada uno de los viajes cerca de 40 ó 50 piedras de hielo al costo actual de B.Cr. 100 por unidad.

El entrepuesto de la CIBRAZEM en Santos cobra tasas tan elevadas que hacen que los barcos sardineros atraquen en Santa Catarina, mandando el pescado por camión al CEASA de São Paulo, lo que redunda en un uso excesivo de combustibles y de energía en plena crisis.

Con relación a alevines, el programa PROPEIXE cuyo autor es el ingeniero agrónomo Paulo Antonio Petraquini Gracco, al contrario de lo que afirma el IV PNDP, presenta un modelo integrado. Utiliza reservorios particulares para la producción de los alevines, regionalmente distribuidos y especializados en especies adaptables a condiciones microclimáticas específicas; previendo un programa de distribución de los alevines; extensión y asistencia técnica integral. El PNDP debería proponer algo semejante, determinando los órganos de fomento y extensión que, a nivel federal, se encargarían del proyecto.

También cabe resaltar la afirmación de que el tambaqui viene siendo moderadamente explotado en la región norte del país. Durante una reciente estancia en Manaus, ratifiqué la observación hecha en 1975, según la cual, la especie venía siendo explotada en un límite máximo de esfuerzo permitido. Hoy son pocas las existencias de bancos de tambaquis, especies omnívoras que viven de la vegetación ciliar gradualmente desmatada.

También se debe resaltar la afirmación: "moderada captura de cangrejos en el nordeste". Esta especie (*Ucides cordatus*) es intensamente explotada en la zona de mayor existencia, el litoral del Estado de Sergipe y que abastece buena parte del mercado regional. Su explotación actual ni siquiera obedece a las restricciones de captura en los meses sin "R" (mayo, junio, julio y agosto) cuando algunos eventos relacionados con la biología de la especie, tiene lugar, tales como: muda de caparazón, mudanza en los hábitos alimenticios, etc.

Además de eso, la entrada en funcionamiento de la unidad de producción de cloreto de potasio de petromisa, a comienzos de 1983 y que lanzará mensualmente al mar 1,3 millones de toneladas de cloreto de sodio, solamente por efectos de la tensión osmótica podrá perjudicar aquellas existencias de la especie, ya alcanzados por atarquinamiento como consecuencia de la construcción del puerto de Aracajú; destrucción de dunas; terraplenes de mangues y modificación del sedimento de fondo que sirve de nicho ecológico al cangrejo.

En lo que se refiere a peces ornamentales, cabe a SUDEPE explicitar las líneas de estudio y creación de incentivos para el cultivo de esas especies, puntos extraidos de un plan de pesca para la Amazonía occidental elaborado por el biólogo Getúlio de Souza Neiva y por el autor de esta monografía en 1975.

El plan también acepta como determinismo insuperable la extinción de la categoría - pescador artesanal - mencionando, como causa obvia, en el caso, el costo de la habitación. Sin embargo, para cotejar tal costo, SUDEPE demuestra desconocer el concepto de propiedad de esas comunidades que atribuyen al sólo valor de uso y no de cambio y donde hacen sus privilegios, inclusive casa y plantación. Competiría a SUDEPE asumir las distorsiones que se dan en la estructura de costos y de precios de terrenos de la faja litoraleña y que emerge dentro de un sistema especulativo que podrá conducir al desaparecimiento de la pesca artesanal en el país, en poco tiempo.

Los macroagregados oferta y consumo están bien descritos en el diagnóstico que da soporte al plan. No se hace referencia, no obstante, a la incapacidad de la economía de generar condiciones para ampliar la oferta de producto de bajo precio para poblaciones carentes en todo el país.

La gran preocupación se concentra en el atendimiento a la demanda externa. La propia modernización preconizada para el sector objetiva el encuentro de procesos productivos que tornen al pescado vendible a precios competitivos en el mercado externo.

Y eso establece conflictos entre metas y estrategias, principalmente, cuando se trata de una política instrumental que jamás será implantada, puesto que contraría la política global establecida para Brasil.

5. COMENTARIOS SOBRE EL MAR DE 200 MILLAS Y ZONAS ECONOMICAS EXCLUSIVAS

Caben aquí, también, algunas consideraciones sobre el mar de 200 millas y sus consecuencias. Sobre el asunto se manifestó (da Costa, 1980) tejiendo consideraciones sobre el sector pesquero, en los últimos años y que se vienen resintiendo de profundas modificaciones e incidentes, en el medio ambiente marino.

Argumenta que, algunos estados costeros, frente al hecho de que la producción pesquera mundial se ha cuadruplicado en los últimos 30 años, alcanzando en 1975, 70 millones de toneladas; vienen sustentando el derecho de propiedad sobre todas las riquezas encontrables a lo largo de sus costas, así como vislumbrando en la creación de Zonas Económicas Exclusivas, la fórmula eficaz para viabilizar la repartición de los océanos, compatibilizando la necesidad de disciplinar la excesiva explotación de numerosos stocks de pesca, promoviendo, además de eso, una gestión nacional de los recursos biológicos del mar.

Después de una vasta disertación sobre el derecho del mar, el autor llega a las Zonas Económicas Exclusivas de 200 millas y al hecho de que los estados costeros, pasaron después de la generalizada adopción, a controlar parcelas significativas de los espacios marítimos, representando así el 35 % de la superficie de los océanos.

De lo que se deduce que, seis estados ya controlan 40 % de esas zonas: los Estados Unidos de América del Norte - el 9 %; Australia - el 8,3 %; Indonesia - el 6,4 %; Nueva Zelandia - el 5,7 %; Canadá - 5,5 % y la URSS - el 5,3 %.

También se evidencia que los diez estados de mayor PNB controlan el 36,5 % de la superficie total de las Zonas Económicas Exclusivas; mientras que otros diez estados de menor PNB mantienen bajo control, solamente el 1,8 % de esta superficie.

En lo que respecta a los recursos biológicos, datos estadísticos de la FAO estiman que el 95 % de esos recursos son explotados justamente en la faja de 200 millas de las Zonas Económicas Exclusivas y por tanto que las mismas, además de englobar a la casi totalidad de las plataformas continentales, se constituyen en las áreas más ricas de producción biológica primaria.

En la misma Conferencia Internacional sobre el Derecho del Mar, se admitió que otros estados emprendiesen la explotación económica de los recursos pesqueros en las Zonas Económicas Exclusivas de 200 millas, en casos de subexplotación por parte de los estados costeros.

La mayor parte de los estados costeros desarrollados, entre ellos los Estados Unidos, Canadá y países de la Comunidad Europea después de la institución de las Zonas Económicas Exclusivas, han puesto en práctica políticas para el sector, tendentes a excluir la participación extranjera en el ejercicio de la pesca en sus aguas, o, restringiendo el acceso a los recursos a través de sistemas rígidos de licencias de pesca y de fijación de cuotas residuales.

Ya los estados costeros del Tercer Mundo, instados a incrementar el progreso del sector pesquero, invariablemente se apoyan en la real o supuesta potencialidad de las riquezas de sus Zonas Económicas Exclusivas de 200 millas, para concluir acuerdos de cooperación con estados desarrollados. Acuerdos pautados que prevén ya la transferencia de tecnología, ya la obligatoriedad de desembarcar en los puertos nacionales parte del producto de la pesca.

Al mismo tiempo, los acuerdos internacionales de pesca se han multiplicado, especialmente entre estados costeros detentores de recursos y estados carentes de recursos. De la misma forma, numerosas sociedades ("joint-ventures") se constituyen, principalmente con el objeto de asegurar el acceso a las Zonas Económicas Exclusivas de 200 millas y para rentabilizar los equipamientos de captura.

De este modo se verifica que la creación de las Zonas Exclusivas, o mejor, de las Zonas Económicas Exclusivas de 200 millas han proporcionado las condiciones para el desarrollo de desdoblamientos, la escala mundial, de las estrategias utilizadas por los estados y empresas multinacionales, en la medida en que la problemática de apropriación de recursos pesqueros demuestra claramente la fragmentación entre estados y empresas provistas o no de medios de explotación.

Respaldado en el dispositivo constitucional contenido en el artículo 55, párrafo I, el Decreto-Ley Nº 1 098 del 25 de marzo de 1970, en su artículo 1º y párrafo único, instituye y delimita el territorio marítimo integrante de la República Federativa de Brasil.

Y basado en todos los argumentos aquí sintetizados (Wladimir, 1980) afirma parecerle "cristalino que una directriz de fijación del mar territorial en 12 millas y la institución de una Zona Económica Exclusiva de 188 millas, representa una salida diplomática frente a estados más fuertes políticamente y que desean aumentar sustancialmente sus áreas de actuación e influencia. Por eso mismo, hay un compromiso político que favorece, justamente, a los llamados más fuertes y enflaquece a los estados costeros que cedieron a tal presión".

Poco después de la creación del mar territorial de 200 millas, tuvo inicio en Brasil el asedio de la JICA - Japan International Corporation Agency - que, bajo pretexto de implantar un acuerdo de cooperación tecnológica en el campo del sector primario de la economía, desencadenó una serie de proyectos que van, desde la plantación del kiri, manipulación de cuencas hidrográficas, producción de simientes florestales, escuela de pesca en Cananéia, donación de equipamientos para navíos de estudios pesqueros para el Instituto de Pesca de São Paulo, hasta otros proyectos de tecnología de plantío en cerrado y en la preamazonía brasileña.

Simulatáneamente aquel país y Brasil firmaron acuerdos de pesca de camarones y tiburones en el litoral norte del país.

Barcos que, juntamente con la flota de bandera americana y de Trinidad y Tobago realizan pesca predatoria en aquella parte del litoral brasileño.

6. ALGUNOS COMENTARIOS ADICIONALES

Comentando la economía moderna y la necesidad de expansión de fronteras, como consecuencia del empleo de tecnologías duras y predatorias, con el consiguiente agotamiento de los recursos dice que, vivimos en la era de la economía de cow-boys. Era en que, por ser los recursos abundantes, su precio se derivaba de su ocupación. De ahí la explotación hasta el agotamiento, pasándose a la explotación de otra área libre. Emigraciones que caracterizaban una verdadera lucha contra la naturaleza.

No es otra la forma cómo se comporta la flota pesquera brasileña, sea ella sardinera, camaronera o langostera.

La explotación de las especies se da hasta que se alcanzan los niveles de extinción de los recursos y de los stocks, transfiriéndose la flota para otras áreas de pesca y/o para otra modalidad de pesca.

También la crisis del petróleo trajo serios problemas para la continuidad en el país.

Examinando la estructura de costos de operación de la flota con sede en Santos y constituida de: trawl de puerta pequeño tipo ballenera; trawl de puerta medio tipo camaronero; pareja de trawls grandes; pareja grande; trainera grande y trainera media, verifiqué que el item "Combustibles y Lubrificantes" constituye, por término medio, el 50 % del total del costo de operación en cualquiera de los barcos analizados.

En cuanto a la renovación de la flota pesquera, todo se complica, ya que, vista la pesca como actividad industrial, inciden sobre ella tasas de intereses sobre financiamientos idénticos a cualquier otro tipo de industria. La única excepción tiene lugar con relación al precio del dinero, en el caso de cooperativas que tienen acceso a dinero con costo menos y oriundo del Banco Nacional de Crédito Cooperativo - BNCC.

También la incidencia del impuesto de circulación de mercancías sobre el pescado destinado al mercado interno, representa un aumento en el precio del producto añadido al consumidor; quedando claro que tal impuesto no incide sobre los productos que se destinan a las exportaciones, como es el caso del camarón.

7. UN MODELO ALTERNATIVO DE DESARROLLO PESQUERO - ESTADO DO MARANHÃO

Un buen acervo de datos resultantes de estudios realizados por el IPEI bajo la dirección del Estadístico Darson Dagoberto Duarte; y del IRN, por parte de la Bióloga Ilka Paixão Prazeres y del Geógrafo José do Ribamar Costa e Silva, permitió que, en 1975, el equipo técnico del proyecto BID/FAO/SUDEPE, a partir de una sugestión mía, diseñase un proyecto de pesca artesanal para el estado.

Por el momento, bajo la coordinación del sociólogo de pesca Paulo Roberto Martins, se realiza en el litoral norte del Estado un estudio profundo y financiado por FINEP sobre la "Caracterización del pescador artesanal del litoral norte marañaense".

Y la Secretaría de Recursos Naturales, Tecnología y Medio Ambiente, ejercida por el antiguo director del IPEI, estableció conmo objetivo sectorial: expandir, desarrollar y multiplicar la producción pesquera en el Estado, de forma sustentada, sin provocar desequilibrios irreversibles.

Para eso, eligió como proyectos prioritarios, además del mencionado ya, los siguientes:

(a) participar en el desarrollo de la pesca artesanal. Promover el perfeccionamiento de la mano de obra en operación en el sector pesquero del Estado, en convenio con las colonias de pescadores;

(b) acompañar la construcción del terminal pesquero que servirá como infraestructura necesaria para la pesca artesanal y apoyo a la pesca industrial, implantando entrepuestos a lo largo de todo el litoral;

(c) acuicultura - en aguas estuarianas - implantando una base de piscicultura y ceba de especies autóctonas de peces y camarones en régimen semiintensivo, desarrollando simultáneamente en la base, tecnologías de manipulación y beneficiamiento de esas especies.

En aguas interiores, implantar una base de piscicultura cuya finalidad será la población y repoblación de lagos, lagunas y reservorios, concientizando a la población sobre la importancia de las propiedades particulares de peces, así como de la mejora de las técnicas de aprovechamiento del pescado y de sus subproductos;

(d) realizar estudios de evaluación del stock de sururus en las reentrancias marañaenses, con el objeto de: determinar áreas de fijación de las simientes y tipo de cultivos aconsejados, además del dimensionamiento del esfuerzo de pesca soportado por el stock;

(e) realizar estudios sobre el procesamiento y comercialización del sururu, para demostrar la factibilidad técnica y económica de la producción y perspectivas de comercialización e industrialización de la especie; e

(f) implantación de una estación de piscicultura en la región del Cerrado Marañaense, fomentando la creación de propiedades particulares de producción de peces, a fin de producir alimento protéico a bajo costo y por agricultores locales.

La estructura de SERNAT bajo forma de sistema y su actuación abarcando recursos naturales, tecnología y medio ambiente, hicieron posible la característica global, integrada y abarcadora del programa.

El no podría ser implantado a partir de los impactos que se vislumbran como consecuencia del proyecto Carajás que interfiere de modo negativo en la racionalización de la ocupación del espacio actual.

El terminal pesquero proyectado por el proyecto FAO/SUDEPE, quedará enclavado entre el terminal de mineral de la Companhia do Vale do Rio Doce y el terminal exclusivo de ALCOA, donde se prevén movimientos anuales de carga del orden de los 18 millones de toneladas de materiales al por menor líquidos y sólidos que serán empleados en el polo mínero-metalúrgico de São Luís.

El corredor de exportaciones de Carajás, a lo largo de la Vía Férrea, ocupando 7 millones de hectáreas; desmatando 2,4 millones de hectáreas de bosques nativos; implantando "polders" que ocasionarán la destrucción de lagunas marginales de la cuenca hidrográfica del Estado y que sirven de nicho ecológico de especies reofílicas de la ictiofauna; el programa PROALCOHOL, sus desmatamientos, uso intensivo de insecticidas, desmatamientos ciliares y lanzamiento de restilo y viñoto traerán consigo la eutrofización de los grandes ríos regionales; inviabilizarán la pesca y la piscicultura de aguas interiores.

La simple construcción del obrador de ALCOA, ya desplazó 7 000 jefes de familia que se ocupaban de la pesca, asociada al cultivo de mandioca y producción de harina, y la producción de hortigranjeros que abastecían la capital del Estado.

También una verdadera civilización de los mangues está siendo paulatinamente destruida por el terraplanado de esos ecosistemas para dar lugar a obradores de industrias, localización de conjuntos residenciales y un discutible proyecto PROMORAR que soterrando los mangues, arranca de sus moradores la actividad de su explotación característica por corte selectivo de madera, recogida del sururu y del sarnambi, pesca de cangrejos, también clasificables como actividades pesqueras.

Vegetaciones de mangues de alta productividad primaria y que, según el ingeniero agrónomo Joaquim Rodrigues Mochel, abrigaba en la faja de influencia salina acerca de 991 385 800 pies de manga de las especies: roja (*Rhizophora mangle*), tinteira (*Cornocapus erectus*), blanca (*Laguncularia racemosa*) y de botón (*Avicennia nitida*).

Y eso se repite a lo largo de la costa brasileña.

Por un lado se expropian áreas de pesca y por otro, se castran manifestaciones culturales y económicas de las poblaciones litoráneas.

Se demuestra así que la adopción de un modelo macroeconómico de intervención en la economía, fruto de decisiones tecnocráticas, está inviabilizando la pesca en todo el país. Y el pescador agricultor expoliado no va a encontrar la opción de transformarse en el "proletario del mar", según el determinismo descrito por Antonio Carlos Diegues en "Pescadores, sitiantes y trabajadores del mar", delante de la nueva realidad brasileña y de la escala y ritmo que vienen imprimiendo a las explotaciones económicas de nuestros recursos naturales.

8. ALGUNAS CONSIDERACIONES SOBRE LA GESTION PLANIFICADA Y RACIONAL DE RECURSOS NATURALES Y DEL MEDIO AMBIENTE

El empleo macizo y abusivo de tecnologías "duras" en todos los sectores de la economía; la ocupación desordenada de los suelos de las fajas litoráneas, de los mangues, de los estuarios, de las lagunas, de las cuencas hidrográficas; la concentración irracional en áreas urbanas; la dilapidación de los recursos no renovables y la contaminación del aire, del agua y de los suelos asumen en los días actuales, escala y ritmo jamás conocidos en las civilizaciones que nos precedieron, imponiendo medidas urgentes que aseguren un futuro para las próximas generaciones.

La formulación de medidas racionales que contemplen tales eventos, debe ser parte de un plan de desarrollo nacional, democrático y participativo, donde deben ordenarse y reordenarse el uso del espacio, definiendo áreas de carácter restrictivo y reglamentado; definiendo políticas de protección del medio ambiente y de los recursos naturales; trazando directrices para la redefinición y redistribución de los asentamientos humanos, integrándolos al medio natural, siempre de acuerdo con las aspiraciones y conveniencias de las comunidades. Y este plan, sustituyendo planificaciones generales de Gobierno, debe servir de normativa para todos los planes sectoriales de una economía, entre los cuales estará un real planeamiento de la pesca.

Sin descuidar la calidad de la vida en aglomerados urbanos, tal plan debe también referirse, con precisión, a criterios ecológicos, determinando los grados de protección de la naturaleza, fijados a partir de datos obtenidos en estudios en los diferentes campos del conocimiento y que influencian en un planeamiento con tales características.

Tal metodología obligará al Gobierno a encontrar procedimientos flexibles que coloquen a su actual estructura administrativa e institucional de planeamiento, de estudio, de fomento, de producción, de extensión, interactuando bajo forma de un sistema de intervención en el cual no podrá faltar la interface representada por toda la comunidad, dentro de una filosofía participativa y por tanto, democrática.

9. SOPORTE POLITICO-ADMINISTRATIVO E INSTITUCIONAL PARA LA IMPLANTACION DE UN PLAN COMO EL DESCRITO

Creación de un ministerio de recursos naturales y medio ambiente que desempeñase funciones hoy adscritas y atomatizadas en otras carteras, en especial las de SUDEPE, IBDF y órganos de política de explotación mineral.

Tal ministerio debería tener "status" de Primer Ministro, con funciones afines, sin embargo, bastante ampliadas con respecto a las que vienen siendo ejercidas por la ONERN --Oficina Nacional de Evaluación de Recursos Naturales del Perú, idealizada, implantada y asistida por la IUCN.

10. EXPLICITACION DE UN PLAN DE GOBIERNO PARA EL SECTOR PESQUERO

Con base en un plan de desarrollo como el descripto en este trabajo, administrado por un órgano como el que se menciona en el mismo, un plan de pesca debería explicitar:

(a) Objetivos

- Incremento de los macroagregados oferta y demanda interna de pescado.
- Racionalización de los sistemas de comercialización del pescado.
- Aumento de la demanda de mano de obra para el sector con mejora de su participación en la renta generada por la actividad.
- Diversificación de la pesca con exploración y explotación de nuevos recursos pesqueros.
- Privilegio a las capturas que demandan menor consumo de combustible fósil.
- Preservación de los recursos hídricos e hidrobios, procurando mantener la producción en los niveles actuales, incrementándola a otros niveles de producción deseados, con tal de que estén dentro de los criterios de explotación sustentada.

(b) Estrategias

- Racionalización de la producción con miras a la maximización del uso del recurso y de los medios de producción.
- Ampliación del mercado interno, a través de programas de disminución de los precios y de la divulgación de las cualidades alimenticias del producto.
- Racionalización y continuidad en los procesos de abastecimiento de los mercados de pescado.
- Racionalización y empleo racional de la capacidad instalada en el sector de industrialización del pescado.
- Acción social junto a las comunidades de pescadores.
- Revisión de los instrumentos económico-financieros puestos a disposición del sector.
- Estudio de nuevas formas de crédito, financiamientos y subsidios atribuidos al sector.
- Ampliación de la red de frío y empleo de la ya existente, de forma más racional y encaminada al atendimiento de las necesidades del sector pesquero.
- Revisión de todos los acuerdos de concesión de pesca a flotas de pabellón extranjero.
- Revisión de todos los programas de asentamientos humanos y de localizaciones industriales junto a la zona costera - principalmente, junto a ecosistemas lagunares y estuarianos.
- Consolidación de leyes con miras a la protección de vegetaciones de mangues y de otros ecosistemas costeros.
- Implantación de programas de educación ambiental dentro de esquemas formales e informales, correlacionando la pesca con la preservación ambiental y manejo racional de recursos pesqueros.
- Registro de arquitectura de barcos y de construcción de cercas y corrales.
- Ampliación de estudios sobre los ciclos hidrológicos, principalmente, con relación a cuencas hidrológicas.

- Uso racional de las cuencas.
- Racionalización de las actividades de plantío en las planicies.
- Protección de lagunas marginales a los grandes ríos.
- Redimensionamiento de represamientos y tratamiento de fondo de zonas que serán inundadas.
- Estudio de la biología de peces de respiración aérea para repoblación de áreas eutrofizadas.
- Protección a dunas y vegetaciones litoráneas.
- Ampliación de programas de fiscalización.
- Revisión de la legislación de protección a especies en extinción.

(c) Instrumentos

- Fomento a la pesca en las áreas de:

  - biología pesquera
  - tecnología de la pesca
  - tecnología del pescado
  - economía de la pesca
  - socio-antropología pesquera
  - acuicultura
  - maricultura
  - legislación básica

- Extensión pesquera:

  - instrumentos económico-financieros
  - crédito
  - desarrollo comunitario
  - financiamientos
  - asistencia técnica
  - subsidios e incentivos

Este plan que aquí presento está inspirado en el IV Plan Nacional de Desarrollo de la Pesca - 1980/85, en el cual contaban gran parte de los párrafos de la lista.

Sin embargo, su implantación por SUDEPE es prácticamente inviable, ya por su estructura organizacional, por su campo de actuación y su vinculación al Ministerio de Agricultura.

Ese Ministerio, en Brasil, tiene por objeto principal el fomento de la producción agropecuaria, totalmente soportada por una tecnología importada e inadaptable a las condiciones microclimáticas brasileñas.

Tecnologías desarrolladas en el hemisferio norte del planeta que convierten a la agricultura aquí practicada totalmente dependiente de insumos, equipamientos y simientes importadas. Lo mismo acontece con la pecuaria.

Además de eso, la pesca es considerada por el Ministerio de Agricultura como una de las actividades de menor grado de prioridad.

Tratada como mero órgano de producción de bienes exportables, la pesca jamás fue considerada en su conjunto, compuesto de mecanismos de gestión racional, manejo sustentado, conservación de stocks, etc.

Probablemente en el sector pesquero se da de forma más evidente la interacción entre el hombre y su medio ambiente y los recursos naturales que tienen que ser explorados mediante el empleo de tecnologías apropiadas y compatibles.

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EL DESARROLLO PESQUERO CUBANO: EXPERIENCIAS Y PERSPECTIVAS ESTUDIO DEL CASO

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RESUMEN

El presente trabajo expone los rasgos fundamentales del desarrollo pesquero cubano, la experiencia nacional en la transformación de las pesquerías artesanales de la plataforma insular, así como el papel desempeñado por la pesca del alto, el mercado y los demás factores en la experiencia pesquera nacional.

En el documento se examinan los objetivos y prioridades establecidos en el pasado para convertir la pesca en un factor importante para el suministro de alimento destinado al consumo interno, así como para el fortalecimiento de la economía, a través de la exportación de productos altamente cotizados en el mercado internacional. Del mismo modo, se exponen las políticas seguidas y las proyectadas para resolver los conflictos que han surgido en el empeño por obtener grandes volúmenes de producción a partir de recursos pesqueros limitados. El establecimiento del nuevo régimen del mar y la situación económica internacional encarecen y dificultan las operaciones pesqueras en las zonas de otros estados y crean un conflicto, que es analizado en el documento junto con las nuevas políticas adoptadas por Cuba para garantizar el desarrollo pesquero ulterior, el cual se fundamenta más en la utilización de las oportunidades que brindan los recursos pesqueros nacionales, que en los ubicados en las zonas económicas de otros estados o en regiones internacionales.

Por último, en este trabajo se mencionan los métodos empleados en el pasado y en el presente para administrar los recursos pesqueros de las aguas nacionales y se señala el papel que según la nueva estrategia pesquera nacional deberá desempeñar las instituciones científicas, los órganos legislativos y los demás factores encargados de administrar los recursos pesqueros para alcanzar un desarrollo pesquero sostenido en el futuro.

1. INTRODUCCION

La industria pesquera constituye un sector importante para la economía cubana. La producción en 1980 alcanzó 186 000 t, compartidas en 111 000 capturas fuera de la Zona Económica y 75 000 dentro de la misma (incluidas 6 300 t de especies de agua dulce); el consumo de pescado en ese mismo año, a peso comestible, fue de 9,5 kg por persona y la obtención de divisas provenientes de la exportación de productos pesqueros fue superior a los US$ 100 millones (MIP, 1981). El sector pesquero, además, proporciona empleo en las ramas extractivas, de procesamiento industrial, de comercialización, construcción naval y los diversos servicios directos a la pesca, a más de 30 000 personas.

Históricamente Cuba no fue un país pesquero, ya que por un lado no posee grandes recursos de este tipo y, a pesar de ser una isla, su población no tenía una tradición marina. El desarrollo de la pesca en Cuba surge como resultado de un esfuerzo dirigido, a través de un sistema de planificación centralizada, a la elevación del nivel de abastecimiento del mercado interno con alimento protéico de origen marino y a la obtención de divisas para fortalecer la economía.

La voluntad de convertir la pesca en un factor importante para satisfacer las necesidades alimenticias de toda la población, a través de la obtención de grandes volúmenes de captura, planteaba un conflicto con el carácter limitado de las disponibilidades de recursos pesqueros en las aguas nacionales. La solución de esta contradicción apareció con la creación de una flota del alto, capaz de operar en caladeros alejados de las costas cubanas. Al generalizarse el establecimiento de zonas ampliadas de jurisdicción pesquera por la mayoría de los estados costeros, ya la flota cubana de gran porte estaba creada y la industria pesquera nacional tuvo que enfrentar un nuevo reto - continuar operando a través de convenios en los caladeros que ahora se encuentran bajo la jurisdicción de otros estados y buscar nuevas zonas de pesca - para mantener o ampliar los volúmenes de captura alcanzados antes de la implantación del nuevo régimen del mar.

De manera que el modelo de desarrollo pesquero adoptado, que se basaba principalmente en la pesca del alto, que era la que ofrecía la posibilidad de obtener grandes volúmenes de captura y en el desarrollo de las pesquería artesanales, donde se capturaban las especies que aportaban la entrada principal de divisas por concepto de exportaciones de productos pesqueros, volvió a colocar a la industria pesquera frente a una situación tensa, cuya solución aún se encuentra en proceso y resultará necesario que transcurra algún tiempo para que el sector pesquero se adapte a las nuevas condiciones, pues a diferencia de muchas naciones en desarrollo que han adquirido grandes recursos pesqueros como consecuencia del nuevo régimen del mar (FAO, 1981a) la economía pesquera cubana no recibe ventajas inmediatas por este concepto, debido a la ya apuntada escasez de dichos recursos en la zona oceánica aledaña a las costas de Cuba. No obstante, se vislumbran soluciones para el futuro desarrollo pesquero cubano, lo cual es analizado en este trabajo, que sin pretender agotar todos los tópicos que pudieran ser incluidos en una obra más completa, expone los rasgos fundamentales de la experiencia cubana en el desarrollo pesquero y postula las líneas de la estrategia pesquera para el futuro.

2. BREVE RECUENTO HISTORICO

Cualquier análisis sobre el desarrollo pesquero cubano tiene que diferenciar dos épocas, la anterior al triunfo de la Revolución, ocurrido en 1959, y la posterior a dicho año. Ello se debe a que hasta 1959 la pesca fue un sector de la economía completamente olvidado, que casi no experimentaba progreso alguno. El Gobierno Revolucionario, sin embargo, desde su arribo al poder comenzó a tomar medidas para mejorar las condiciones de vida de las comunidades pesqueras y aumentar la producción de productos del mar.

Tradicionalmente la pesca cubana se llevaba a cabo en la zona costera y en alguna medida en Campeche, La Florida y Bahamas. Se trataba de una pesquería completamente artesanal según aparece descrita por Sánchez y Gómez de la Maza (1952). Se ocupaban en la rama extractiva unos 13 000 pescadores entre profesionales y eventuales, que con unas 5 000 embarcaciones, de vela y remos, la mayor parte producían capturas del orden de 20 000 t; el consumo anual de pescado se estimaba en 4 kg por persona (Salmon, 1963).

La pesca fue considerada por el Gobierno Revolucionario como una gran fuente potencial para la obtención de alimento protéico, valioso y de relativamente fácil obtención con el cual contribuir a satisfacer las necesidades alimenticias de todas las capas sociales cubanas. Para utilizar los recursos pesqueros con ese fin y comenzar a combatir la pobreza y el atraso tecnológico en el sector pesquero, que era una condición impostergable para poder proponerse aumentos en la producción pesquera, el Gobierno comenzó a tomar medidas consistentes en una reforma administrativa para concentrar todas las funciones de atención a la pesca en una sola unidad gubernamental; la organización de cooperativas pesqueras, el establecimiento de astilleros para la construcción de embarcaciones más modernas y un programa de construcción de viviendas para mejorar las condiciones de vida de los pescadores. La materialización de estas medidas permitía, además, mantener al Gobierno en contacto permanente con los problemas del sector pesquero para fomentar su desarrollo con el fin de convertirlo en una rama independiente de la economía nacional.

En 1961, los objetivos y metas de desarrollo pesquero pasaron a formar parte del Plan Nacional de Desarrollo Económico y Social de la nación, y se definió como objetivo fundamental para el sector pesquero el aumento constante de las capturas para:

- incrementar el nivel de consumo de la población;
- crear fuentes de empleo en actividades relacionadas con la pesca;
- mejorar las condiciones de vida de los pescadores y su familia.

En lo adelante, como es propio del sistema de planificación centralizada, el desarrollo pesquero fue objeto de programación a largo plazo con precisiones y rectificaciones a través de los planes anuales para enmarcar los deseos en la realidad económica y social del país.

En lo que respecta a los objetivos del desarrollo pesquero, el aumento constante de los niveles de consumo continuó en el primer orden de prioridad y en el segundo se inscribió el de destinar los productos altamente cotizados en el mercado internacional, como la langosta, los camarones y los túnidos, a la exportación para fortalecer la economía nacional y contribuir a compensar erogaciones en divisa que demandaban las inversiones en el sector pesquero.

El rumbo trazado por la política de desarrollo pesquero condujo a Cuba a la obtención en 1978 de una captura de 213 000 t. Este resultado se alcanzó como consecuencia de la creación de una flota de gran porte; la modernización de la flota de plataforma y fuertes inversiones de capital en instalaciones de tierra para la transformación, el almacenamiento y la distribución de los productos y los servicios técnicos de la industria pesquera.

Resultaron relevantes, además, para hacer posible el éxito del desarrollo pesquero, la capacitación masiva de especialistas, técnicos y obreros calificados y la construcción de obras como el puerto pesquero de La Habana.

En este recuento breve merece ser destacada por su importancia para el desarrollo de las pesquerías artesanales cubanas, la creación de cooperativas pesqueras. Esta forma de organización suprimió un gran número de intermediarios que controlaban las capturas, el mercado, la industria de transformación, la construcción naval y los servicios técnicos (Salmon, 1963) y mantenían una inestabilidad constante en los precios del pescado, ya que su objetivo era comprarle barato al pescador y venderle caro al consumidor. Las cooperativas establecieron precios fijos para la compra del pescado, redujeron los intereses a pagar por los pescadores por concepto de utilización de los medios de producción (INRA, 1962), asumieron todas las funciones que anteriormente tenían los intermediarios (excepto las del procesamiento y la distribución de los productos pesqueros que quedaron a cargo de empresas estatales), sin proponerse como fin supremo la obtención de ganancias.

En el plano social a través de las cooperativas, el Gobierno canalizó fondos para la construcción de viviendas para los pescadores, instalaciones médico-sanitarias en las localidades pesqueras, escuelas para los hijos de los pescadores y también para adultos; así como instalaciones deportivas y culturales para el disfrute de las comunidades pesqueras. En lo referente al desarrollo tecnológico, las cooperativas hicieron un aporte relevante, ya que a través de estas se comenzaron a sustituir las embarcaciones de vela y remo por otras equipadas con motor y técnicas de pesca más productivas.

La creación de las cooperativas, por otro lado, permitió perfilar los contornos de la pesca cubana como actividad económica independiente, ya que si anteriormente un gran número de los pescadores vivían dispersos a lo largo de las costas y en los cayos y dedicaban parte de su tiempo laboral a otras actividades rurales, después de la creación de las cooperativas, debido al aseguramiento de la subsistencia que éstas ofrecían, tuvo lugar de inmediato una disminución del número de pescadores eventuales, a través de la especialización y una mayor concentración, que constituían las bases para las transformaciones económicas, sociales y tecnológicas a que estaba sujeta la pesca artesanal.

Las cooperativas pesqueras se crearon en el contexto de una serie de medidas socioeconómicas tomadas por el Gobierno Revolucionario, tales como la reforma agraria, la confiscación de bienes mal habidos y otras, inspiradas en las aspiraciones reivindicativas de las clases que habían sufrido la explotación.

De esta manera, el capital de las cooperativas se formó con los aportes que hizo el Gobierno mediante la estatalización de medios de producción de grandes armadores y créditos para el desarrollo, donaciones de embarcaciones y artes de pesca hechas por pescadores-propietarios y la asociación de otros pescadores-propietarios que voluntariamente entraban en las cooperativas, manteniendo los títulos de propiedad sobre sus medios de producción, pero disponiéndolos para el uso colectivo. Este carácter de propiedad mixta con predominio de la colectiva, representada ésta por el Estado, facilitó que en los últimos años de la

década del 60, al producirse una mayor concentración de la industria pesquera, sobre la base de las cooperativas, se pudieran organizar unidades de producción regidas por una empresa estatal nacional, que además de las funciones que anteriormente tenían las cooperativas, adquirieran la de procesar los productos pesqueros.

Estas unidades estatales de producción le dieron origen a los combinados pesqueros, que son empresas especializadas en la producción pesquera de una manera integral (Benjamín, 1979).

Las cooperativas pesqueras en un inicio y las empresas estatales posteriormente, cambiaron completamente el panorama de las pesquerías artesanales de la plataforma cubana. En términos cuantitativos, el cambio producido en dos décadas de desarrollo pesquero se manifiesta en que las capturas de estas pesquerías han aumentado en 3 veces, el número de pescadores dedicados a esta actividad se ha reducido en 2,5 veces y la productividad, expresada en toneladas de capturas por hombre al año ha crecido en 5 veces.

3. PESQUERIAS DE LA PLATAFORMA

La plataforma cubana consta de 4 zonas extensas de poca profundidad, en cuyo interior y sus alrededores se llevan a cabo las pesquerías comerciales tradicionales de mariscos y peces de escama. Esta pesquería transcurre exclusivamente dentro de las aguas jurisdiccionales y la efectúan solamente pescadores nacionales. Si se toma como base el grado de mecanización, el modo de operaciones y la supeditación de la pesca a la habilidad manual del hombre, las pesquerías de la plataforma caerían dentro de la formulación general de la pesca artesanal.

Actualmente, sin embargo, estas pesquerías se encuentran en pleno proceso de evolución tecnológica, pudiéndose clasificar una parte como pesquerías industriales (captura de camarón con redes de arrastre), otra como pesquerías semi-industriales (captura de la langosta con chinchorro y nasas, captura de peces de escama con chinchorro) y finalmente las pesquerías puramente artesanales (recolección de moluscos y esponjas, pesca al anzuelo con líneas de mano).

La captura anual de la plataforma, desde finales de la década del 70 se ha mantenido ligeramente por encima de 60 000 t, compuesta esquemáticamente en números redondos por langosta espinosa (10 000 t), camarones penéidos (5 000 t), peces de escama (20 000 t), fauna de acompañamiento de la pesquería de camarón (20 000 t) y moluscos, quelonios, esponjas y otros crustáceos (algo más de 5 000 t). El esfuerzo pesquero actual es de 1 700 embarcaciones de más de 10 m de eslora, todas propulsadas a motor.

El potencial de captura de todas las especies tradicionales juntas ha sido estimado en 80 000 t (Baisre, 1982). Queda por determinar aún la captura adicional que se pudiera obtener mediante la explotación de los peces demersales de los bancos que están dentro de la Zona Económica de Cuba, pero fuera de la plataforma, así como de los cefalópodos y los pequeños pelágicos oceánicos que no se explotan ni se han estudiado suficientemente.

Las pesquerías de la plataforma representan por otro lado, uno de los rubros más importantes de la economía pesquera cubana, ya que aportan más del 80 % de los fondos exportables del sector pesquero; 25 000 t de peces de escama y mariscos que se destinan al consumo interno y 20 000 t de especies que se dedican a la preparación de alimento animal. Los recursos que sustentan estas pesquerías son, además, junto con la acuicultura, la materia prima más segura con que cuenta la industria pesquera, lo cual tiene gran relevancia para un país pequeño que ha sido objeto del bloqueo económico y de otras formas de ostigamiento de su economía. De acuerdo con la estrategia de pesca actual, es de esperarse que en el decenio 1981-90 se alcance la captura máxima sostenible de prácticamente todas las especies de importancia comercial de las aguas marinas nacionales y que las medidas de regulación, la introducción de la mecanización masiva en los procesos de captura y el procesamiento industrial de todas las especies, permitan aumentar considerablemente los beneficios económicos de estas pesquerías.

4. PESQUERIAS DEL ALTO

La verdadera pesca cubana del alto comenzó con la creación en 1962 de una empresa estatal, a la que se le asignaron de inmediato 2 barcos arrastreros de 25 m de eslora, construidos en Polonia, 5 arrastreros de 54 m, de procedencia de la URSS y 5 palangreros atuneros de 48 m adquiridos en Japón (INP, 1971). Con estos medios se inició el proceso de formación de la flota cubana de gran distancia que contaba en 1979 con 35 barcos arrastreros, entre ellos 26 de 106 m de eslora, 23 palangreros atuneros y 1 atunero cerquero (MIP, 1981).

Además de la flota de gran porte fue organizada otra empresa estatal para la operación de barcos de tonelaje mediano (flota intermedia) para la pesca en el Golfo de México y el mar Caribe.

Esta empresa utilizó además algunos barcos camaroneros hasta 1968 en que se creó una flota camaronera con la adquisición de 90 neveros españoles y 30 congeladores franceses, que debían dislocarse en la costa sur de Cuba y en zonas de otros Estados a donde tenían acceso.

La estrategia seguida por Cuba para la expansión de las pesquerías a través del uso de una flota pesquera del alto se basó en el principio de acceso libre a los recursos pesqueros de todo el mundo y cuando ya se advertía la posibilidad de un cambio importante en el régimen del mar, que evidenciaba dificultades para operar fuera de las aguas nacionales, la flota cubana del alto no había alcanzado aún un volumen que hiciera pensar en la imposibilidad de seguir operando por falta de zonas donde dislocar las unidades de pesca. Hay que tener en cuenta también que en los años 60 y principios de la década siguiente, que fue cuando Cuba diseñó los planes de expansión de las pesquerías del alto, el panorama mundial referente a las existencias de recursos pesqueros era optimista, ya que si bien hubo autores como Gulland (1971) que postularon que las pesquerías mundiales de recursos convencionales alcanzarían el máximo sostenible en los 10 años subsiguientes, al mismo tiempo esos autores señalaban la posibilidad de continuar la expansión de la pesca a través de la asimilación de nuevos recursos como el krill, los mictófidos y otras especies no convencionales.

El resultado concreto obtenido por Cuba ha sido un incremento indiscutible de los niveles de alimentación de la población con productos pesqueros, provenientes en su mayoría de las capturas que realiza la flota del alto.

La posibilidad de mantener el volumen de captura actual y quizás incrementarlo ligeramente, dependerá del tiempo que resulte necesario para que madure el proceso de adaptación de la comunidad pesquera internacional a la nueva situación creada por el derecho del mar. Dicho proceso debe conducir a la creación de mecanismos apropiados que a través del pago de derechos, la concesión de ayuda para el desarrollo, la formación de empresas conjuntas y otros arreglos para que el estado ribereño participe en los beneficios derivados de la explotación de los recursos pesqueros en su zona (FAO, 1981) permitan mantener las flotas de gran porte en operaciones.

Por otro lado, la flota arrastrera cubana es relativamente pequeña y de hecho, si se operan bien los barcos, con las posibilidades de pesca fuera de las zonas económicas de los estados ribereños y con las cuotas de captura que ha estado obteniendo Cuba en las zonas de otros estados (México, Canadá, etc.) es posible no sólo mantener los volúmenes de producción de 1976 y 1977, sino aumentarlos ligeramente.

La flota de palangreros atuneros no ha experimentado afectaciones por el nuevo régimen del mar, ya que realiza sus operaciones de pesca en aguas internacionales. No obstante, se trata de una pesquería, cuyo fin es la creación de fondos de exportación para la obtención de divisas y su crecimiento o disminución en el futuro estará en dependencia de lo resultante entre los costos de producción y el valor de las capturas en el mercado internacional.

Los acuerdos con México han permitido mantener la flota palangrera de fondo y es de esperar que continúe en el mismo nivel. La camaronera, sin embargo, ha ido experimentando limitaciones para el acceso a los recursos, lo cual se ha ido atenuando porque se han podido reubicar barcos en la Zona Económica de Cuba, pero no es de esperarse cambios favorables

que permitan volver a operar en la zona de otros estados, excepto que se formen empresas conjuntas con otros países, pero los recursos camaroneros están plenamente explotados en casi todas las zonas del mundo y el margen para incrementar las capturas es muy reducido.

5. ACUICULTURA

Hasta años muy recientes la acuicultura permaneció fuera de los objetivos del desarrollo pesquero de Cuba, ya que las especies endémicas, así como algunas exóticas que se habían aclimatado en el país ofrecían pocas perspectivas para sostener una producción importante. A principios de la década del 60 fueron introducidas varias especies del género *Tilapia*, con las cuales se repoblaron embalses naturales y artificiales sin un objetivo claramente definido. No obstante, las disponibilidades de agua embalsada, que se han creado como consecuencia de un vasto programa nacional de desarrollo hidráulico y las excelentes condiciones de la tilapia para adaptarse a la vida en los embalses, han motivado al Gobierno a considerar el cultivo de estas especies como uno de los rubros importantes del desarrollo pesquero.

Los hechos permiten augurar un lugar destacado para la acuicultura de agua dulce en el desarrollo pesquero cubano de los años próximos. Solamente con la toma de algunas medidas organizativas que comenzaron en 1976, se fueron obteniendo capturas de peces de agua dulce a un ritmo que duplicaba cada año la producción del anterior, para situarla en más de 10 000 t en 1981. Los programas actuales de investigación científica incluido un proyecto PNUD/FAO para el desarrollo de la acuicultura en Cuba, la siembra de alevines en los embalses, la aplicación de tecnologías productivas para la captura, la creación de facilidades para el almacenamiento y el procesamiento de los productos permitirán mantener un ritmo ascendente en la producción.

La piscicultura en un país como Cuba, con un período vegetativo constante, ofrece perspectivas muy favorables para el desarrollo de sistemas de cría, lo cual puede llegar a convertir esta rama en la dominante dentro del sector pesquero. Esta circunstancia ha sido tomada en cuenta y el desarrollo de la acuicultura de agua dulce constituye una de las nuevas líneas adoptadas por el Gobierno para compensar el corte que ha sufrido la tasa de incremento de las capturas en las zonas marinas como consecuencia de los cambios introducidos por el nuevo régimen del mar, y la crisis económica mundial. Para lograr estos objetivos se está ejecutando un programa de desarrollo, que incluye la construcción de estaciones de producción de alevines de tilapia y otras especies aclimatadas, la construcción de centros de recepción para ser instaladas en las cercanías de los cuerpos de agua a explotar y la utilización de las capacidades creadas por la industria pesquera en almacenes refrigerados, instalaciones para el procesamiento, la distribución y otras, destinadas originalmente a la pesca marítima, pero que sirve igualmente para fomentar la acuicultura. Para aumentar la producción en el mismo espacio acuático se han introducido en el país carpas herbívoras, bagre de canal y otras especies que junto con la tilapia forman poblaciones de policultivo de alta productividad.

El cultivo de organismos marinos también representa interés para el futuro desarrollo pesquero cubano. Por el momento esta forma de cultivo ofrece perspectivas más modestas que la de especies de agua dulce, pero organismos como el ostión de mangle, para el cual se ha elaborado un método original de cultivo (Nikolic, Bosch y Vásquez, 1976) pudieran aportar varios miles de toneladas acuales. Otras especies como los camarones penéidos y las lisas han sido objeto de estudio y su cultivo experimental se está llevando a cabo actualmente.

6. PROCESAMIENTO Y COMERCIALIZACION

La industria cubana de procesamiento de productos pesqueros se ha orientado principalmente a la producción de congelados para el mercado interno y congelados, enlatados y otras formas de conservación para las exportaciones. Esta estrategia determinó que los medios tecnológicos instalados a bordo de los barcos para el procesamiento y el mantenimiento de las capturas fueran las adecuadas, pero las instalaciones para la transformación de la materia prima, con excepción de las destinadas a procesar los productos congelados, sean insuficientes para satisfacer los requerimientos actuales del mercado interno.

Por otro lado, el desarrollo alcanzado en el país por la industria de procesamiento de otros productos alimenticios colocan al pescado en una posición de desventaja, por lo cual se impone la necesidad de encontrar soluciones satisfactorias. Para resolver esta situación se han tomado medidas tales como la adaptación de las plantas existentes con vistas a la ampliación de surtido de productos elaborados que se ofertan a la población (embutidos de pescado, sopas, tortas, ahumados, etc.), lo cual marca una tendencia hacia la diversificación de los productos, pero la solución definitiva del problema se avisora a un plazo más largo, con la puesta en marcha de una nueva planta procesadora de gran capacidad que se está construyendo y la readaptación continua de las ya existentes. El procesamiento industrial de los productos pesqueros está considerado por la estrategia actual del desarrollo pesquero cubano, como un factor de suma importancia, debido a que los incrementos que se pueden lograr a través de un mejor aprovechamiento de la materia prima durante su elaboración y el valor que se incorpora al producto a través de su procesamiento, puede incidir de manera significativa en el enfrentamiento a las afectaciones causadas a la economía pesquera por el incremento de los costos de producción derivados del nuevo régimen del mar y del alza de los precios de los materiales y los servicios en el exterior.

Al triunfar la Revolución, en Cuba se consumía pescado en la ciudad de La Habana, en los puertos pesqueros y en menor medida en las ciudades cabeceras de las provincias (INP, 1972).

En las zonas rurales solamente se consumía bacalao seco y sardinas enlatadas, provenientes de la importación.

Las primeras medidas importantes tomadas para cambiar la situación del mercado fue la construcción de la red de frigoríficos (puerto pesquero de La Habana, almacenes provinciales, etc.) incluyendo camiones isotérmicos para la distribución de pescado fresco o congelado en el campo, incluso hasta en las regiones montañosas. Actualmente existe la infraestructura adecuada para hacer llegar el pescado a todo el país, de acuerdo con los planes de distribución previstos y de hecho el consumo se ha incrementado de apenas 4 kg en 1958 a más de 9 en 1981. Este aumento del consumo de pescado en un país que no tenía ese hábito se ha debido a los factores siguientes:

- la distribución del pescado en las zonas rurales donde no se consumía antiguamente por no existir medios capaces de hacerlo llegar en formas diversas como ha sido el congelado y fresco, además del enlatado y el curado, que eran los únicos conocidos en dichas zonas;

- la distribución de manera planificada de productos pesqueros a centros de asistencia médica, escuelas, jardines infantiles y otras instituciones de consumo colectivo. Particularmente relevante ha sido el hábito de consumo de pescado desarrollado en la población joven cubana.

El mercado interno ha sido un factor importante para el desarrollo pesquero cubano, ya que el incremento del hábito de consumo de estos productos por una población que se ha duplicado en las dos últimas décadas, ha constituido un estímulo permanente para el aumento de la producción pesquera.

Las exportaciones han ocupado un segundo lugar en las prioridades del destino de los productos pesqueros cubanos.

Como ya se ha dicho en este trabajo, Cuba ha destinado a este fin productos altamente cotizados en el mercado internacional, por cuyo concepto ha obtenido entradas significativas de divisas, con lo cual ha contribuido al fortalecimiento de la economía nacional y al fomento del propio desarrollo pesquero. Para el futuro esta estrategia se enfatizará a través de la exportación de los productos de alto valor intrínseco como la langosta y los camarones, que debido a su nobleza, se pueden colocar en el mercado externo con un procesamiento sencillo y de bajo costo o como el atún, que se elabora con buena calidad a través de métodos tradicionales.

A la exportación se destinarán también otros productos y subproductos de la industria pesquera, particularmente no comestibles y que no satisfacen necesidades perentorias en el plano interno, tales como pieles y sus derivados o alimentos del tipo de los petfood.

7. INVESTIGACIONES Y TRANSFERENCIA DE TECNOLOGIA

Las investigaciones científicas llevadas a cabo por el Centro de Investigaciones Pesqueras y el Centro de Investigaciones Tecnológicas de la Industria Pesquera han sido decisivas para alcanzar los resultados que ha obtenido Cuba en el desarrollo pesquero. Las investigaciones sobre los recursos pesqueros en las aguas marinas nacionales inicialmente describieron las especies y el medio oceanográfico y en la década del 70 comenzaron a aparecer las evaluaciones de abundancia de recursos, resumidas en Baisre y Paez (1981). Esta información sirvió de base para sustentar los planes de producción en la plataforma y sus alrededores y para proyectar el desarrollo de la capacidad pesquera para las aguas nacionales. También significativo ha sido el aporte de las investigaciones sobre los recursos pesqueros y las técnicas de captura en las zonas internacionales, lo cual ha efectuado Cuba en cooperación con las comisiones regionales de pesca, a través de convenios bilaterales con la Unión de Repúblicas Socialistas Soviéticas y otros países y mediante proyectos de desarrollo pesquero auspiciados por el PNUD y la FAO.

A la investigación sobre la tecnología de procesamiento se le dedicó poca atención a los primeros años del desarrollo pesquero. A partir de 1976 se ha trabajado sistemáticamente en la búsqueda de soluciones para los diversos problemas que presenta la industria de procesamiento. Para el futuro la investigación científica debe concentrarse aún más en el estudio de los problemas relacionados con la administración de los recursos pesqueros nacionales, el cultivo de especies comerciales, la mecanización de la construcción y operación de las artes de pesca artesanales, la diversificación del surtido de productos pesqueros para el mercado y lograr un mayor aprovechamiento de la materia prima que obtenga la industria pesquera nacional. La transferencia de tecnología ha sido otra experiencia interesante del desarrollo pesquero cubano. Solamente las pesquerías de altura se han desarrollado sobre una base pura de transferencia de tecnologías provenientes de países desarrollados.

La forma de la transferencia ha sido casi en todos los casos de manera directa de los nacionales del país "donante" a los cubanos. Para esto ha sido necesario junto con la adquisición de una tecnología, la contratación de la asistencia técnica correspondiente.

Los expertos internacionales han sido ampliamente utilizados en calidad de maestros para especializar la fuerza de trabajo nacional encargada de asimilar las nuevas tecnologías. Actualmente, las tecnologías fundamentales para la pesca y la transformación de los productos pesqueros han sido asimiladas por los Cubanos y son raros los expertos extranjeros a bordo de los barcos y en las instalaciones de tierra. La colaboración y la transferencia de tecnología son efectivos solamente cuando el país receptor tiene definida una política de desarrollo nacional y voluntad suficiente para llevarla a vías de hecho (FAO, 1981b). Esas condiciones han existido en Cuba después del triunfo de la Revolución, donde el desarrollo pesquero se convirtió en un objetivo concreto como parte del desarrollo socioeconómico del país en su conjunto.

De esta manera, la colaboración recibida del exterior pasaba a formar parte de los planes nacionales de desarrollo. En años más recientes dicha colaboración en el sector pesquero ha ido disminuyendo como consecuencia del grado de autosuficiencia alcanzada por el país y se ha ido incrementando, en cambio, la colaboración brindada por Cuba a otros países del Tercer Mundo. Las perspectivas en el futuro deben ser de ampliación de la cooperación con la comunidad pesquera internacional y un incremento particular con los países en vías de desarrollo.

8. ADMINISTRACION Y UTILIZACION DE LOS RECURSOS PESQUEROS

Desde 1959 la actividad pesquera cubana ha estado regida por una sola unidad estatal (hasta 1964 el Departamento de Pesca del Instituto Nacional de Reforma Agraria; hasta 1976 el Instituto Nacional de la Pesca y desde entonces el Ministerio de la Industria Pesquera). Independientemente de su rango, dicho organismo ha centralizado las actividades de pesca extractiva, elaboración de los productos pesqueros, comercialización (incluyendo las exportaciones desde 1967) y construcción naval, así como las investigaciones científicas, la capacitación y todos los servicios técnicos directos, a través de empresas y unidades presupuestadas especializadas en asuntos pesqueros.

La legislación básica sobre la administración y el uso de los recursos pesqueros estuvo contenida en una Ley de 1936 y su reglamento, que establecían el dominio del Estado sobre la fauna marina y fluvial, el límite de las aguas jurisdiccionales a los efectos de la pesca y normaba lo relativo a las embarcaciones pesqueras, las artes y las zonas de pesca y las especies acuáticas.

Hasta los años 60 la legislación pesquera vigente resultó satisfactoria. Sin embargo, la estatalización de los medios de producción en el sector pesquero, la transformación tecnológica y el aumento de la capacidad de las pesquerías artesanales, la declaración en 1977 de una Zona Económica Exclusiva de 200 millas, así como el avance de los conocimientos científicos sobre el comportamiento de las especies, y la evolución del uso múltiple del espacio acuático, han ido demandando con el tiempo cambios de legislación pesquera, que se han resuelto mediante ajustes y modificaciones.

Más recientemente el Gobierno ha promulgado una Ley de Protección del Medio Ambiente y el uso Racional de los Recursos Naturales (enero de 1981) que incluye preceptos sobre el uso de los recursos pesqueros y un reglamento para la Pesca no Comercial (abril de 1982) que junto con el proyecto de Reglamento para la Pesca Comercial (presentado para su promulgación próximamente) conforma la legislación pesquera nacional, que toma en cuenta los cambios ocurridos en este sector, sustituye la ley antigua y crea el marco adecuado para ejercer las responsabilidades que demanda del Estado el nuevo régimen del mar.

La función de aplicación de la Ley para proteger los recursos pesqueros hasta 1959 estuvo a cargo del servicio de guardacostas de la marina de guerra, el cual se ocupaba también de perseguir el contrabando y de otras actividades, de modo que la vigilancia pesquera era eventual. La Revolución triunfante disolvió el cuerpo de guardacostas y pasó todas las funciones de control de la administración pesquera para el órgano estatal de pesca, pero hasta 1980 no se volvió a instituir la inspección pesquera.

El control sobre el esfuerzo pesquero, la especificación de requisitos para las artes de pesca y la asignación de cuotas de captura, que son actualmente medidas usuales para administrar y proteger los recursos pesqueros en muchos países (Troadec,1983) se han aplicado con poca frecuencia en las pesquerías de las aguas cubanas.

En cambio, la veda de especies o lugares y el establecimiento de una talla mínima de desembarque que se venían empleando desde principios de este siglo (Martínez y Pedrosa Pinto, 1981) continuaban siendo hasta época reciente las medidas principales utilizadas para proteger los recursos pesqueros.

Este enfoque tradicional de la administración pesquera, aplicado a especies costeras, que son las principales que sustentan las pesquerías de la plataforma cubana, en una época en que había tenido lugar un crecimiento extraordinario de la capacidad pesquera como consecuencia de la transformación tecnológica de las pesquerías artesanales, condujo al agotamiento en algunas zonas de poblaciones de especies como la biajaiba, *Lutjanus synagris*, el cangrejo moro, *Menippe mercenaria*, y otras (Cruz, 1978). Incluso la langosta, *Panulirus argus*, y los camarones, *Penaeus* spp., que se suponían estar bien cuidados, mostraban oscilaciones en las capturas anuales que más tarde han sido atribuidas a fallas en los métodos de la administración pesquera (Baisre, 1982a).

A finales de la década del 70 se evidenciaba que las pesquerías de las aguas nacionales estaban sujetas a desempeñar un papel aún más importante en el futuro desarrollo pesquero cubano y se comenzaron a intensificar las medidas de regulación sobre dichas pesquerías. Para esto se ampliaron más las medidas cualitativas tradicionales y comenzaron a aplicarse algunas de tipo cuantitativo como limitaciones del esfuerzo pesquero, control de las artes de pesca y otras.

Como resultado del nuevo enfoque de la administración pesquera se ha logrado obtener mayores volúmenes de captura en la langosta (Baisre, *op. cit.*) y se ha restablecido la abundancia de especies como el cangrejo moro y otras en las zonas que habían disminuído. En lo adelante, para alcanzar los objetivos trazados de obtener de los recursos de las aguas nacionales el máximo rendimiento posible, como base para el desarrollo constante de las pesquerías domésticas, se puede considerar que la legislación pesquera existente es apropiada, aunque se requiere continuar incrementando el establecimiento de normas específicas para proteger mejor los recursos pesqueros; el apoyo que recibe la administración pesquera

de las instituciones científicas también es adecuado, pero se requiere orientar aún más las investigaciones hacia los problemas de manejo de todas las pesquerías artesanales; por último, un factor tan decisivo como la aplicación de la Ley en lo que se refiere a medios y facilidades para ejercer la inspección y el control de las pesquerías, que ha sido el aspecto más atrasado de la administración pesquera cubana, se ha ido creando en los últimos dos años, pero requiere aún de un reforzamiento sustancial para poder desempeñar el papel que le corresponde en el sistema de protección y utilización de los recursos pesqueros.

9. CONCLUSIONES

Cuba ha alcanzado un lugar destacado entre los países en vías de desarrollo por el volumen de sus capturas, así como por el papel que desempeñan los productos pesqueros en el consumo nacional y en la obtención de divisas.

El nuevo régimen del mar no ofrece ventajas inmediatas para el desarrollo pesquero cubano debido a la escasez de recursos dentro de la Zona Económica Exclusiva. Por el contrario, es necesario desarrollar una capacidad negociadora activa y adaptarse a la pesca en regiones fuera de la jurisdicción de otros estados para poder dislocar todas las unidades de pesca de la flota del alto y mantener los niveles de suministro de pescado al mercado interno.

La política pesquera de un país debe comenzar por la base de recursos sobre la cual se sustentan las pesquerías (Pearse, 1981) y en casos como el de Cuba, por las razones ya señaladas, para garantizar un desarrollo pesquero sostenido, la opción más segura es la explotación de los recursos nacionales, al menos hasta que se definan y estabilicen los métodos para el acceso a los recursos pesqueros bajo la jurisdicción de los estados.

En la nueva estrategia trazada actualmente por Cuba se plantea un desarrollo pesquero para el futuro basado más en el aprovechamiento máximo de las oportunidades que ofrecen los recursos nacionales, que en la explotación de los ubicados en las zonas de otros estados o fuera de éstos.

Como se ha dicho, Cuba no cuenta con recursos pesqueros abundantes dentro de la zona económica, ni con grandes cuencas de aguas interiores donde obtener grandes volúmenes de producción a través de un crecimiento simple de las inversiones de capital. Por esta razón, el desarrollo pesquero ulterior del país tiene que basarse en una utilización plena de los recursos naturales disponibles.

Las reservas de las aguas marinas nacionales en pelágicos pequeños y especies demersales permiten aumentar el volumen de las capturas de las pesquerías domésticas en no menos de un 30 % por encima del nivel actual; y la acuicultura tiene potencial para aportar decenas de miles de toneladas de pescados y mariscos. Además de estas dos vías, el desarrollo pesquero futuro puede recibir aportes significativos, mediante la mecanización de los procesos de captura y una mejor organización del trabajo para reducir los costos de operaciones y aumentar la productividad del trabajo en las pesquerías artesanales.

La industria de procesamiento puede contribuir de manera relevante al aumento del valor de los productos, a través de la elaboración de un surtido cada vez más amplio, la elevación de la calidad de los productos y el mejor aprovechamiento de la materia prima. Las investigaciones científicas, tienen un papel importante que desempeñar para indicar las mejores opciones de desarrollo en el futuro y administrar correctamente los recursos pesqueros.

La administración de los recursos pesqueros domésticos tiene que ser acertada para poder alcanzar objetivos de desarrollo (FAO, 1980). Esta afirmación tendrá mayor relevancia para Cuba en la medida que las capturas se aproximen a su rendimiento máximo. Las medidas de administración figurarán como parte integrante de los planes de desarrollo pesquero y será necesario, además, conjugar el interés inmediato del desarrollo con los requerimientos de las especies para su reposición.

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FISHERIES DEVELOPMENT IN INDONESIA
CASE STUDY

by

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ABSTRACT

The Indonesian fisheries is dominated by small-scale operations, mostly concentrated at the densely populated islands in the country, causing unbalanced utilization of fishery resources between the western waters and the eastern waters of the archipelago. This forms the basis for the policy to develop both the small-scale and the large-scale fisheries simultaneously by allocating distinct areas for each type of fisheries.

The Government however, is giving the development of the small-scale fisheries the highest priority. To help the small-scale fisheries, facilities are provided covering financial assistance, technological development, institutional improvement, and regulatory measures.

To protect the inshore marine fishermen from other fishermen using more sophisticated fishing methods, the Government established fishing zones parallel to the coastline. Due to lack of an effective enforcement machinery, the application of the zoning system to the trawl fisheries has to be terminated with the trawl ban in all Indonesian waters.

Assistance provided to the inshore fishermen to modernize their fishing efforts and to go farther offshore has not quite been successful because the size limit for the small-scale credit scheme applied before did not cover larger boats suitable for offshore operations. The policy has eventually been revised, and besides the new small-scale credit scheme, other credit facilities suitable to medium-scale operators are also provided.

The inland capture fisheries has almost been stagnant primarily because of diversion of manpower to the forest industry. Although all credit facilities provided to the marine fishermen are basically valid to their inland counterparts, due to the remoteness of the area, lack of infrastructure and institutional back-up, not much of the facilities could be benefitted by the inland fishermen. Government interventions are directed to the protection of fish stock through the establishment of conservation areas and carrying out restocking programmes.

Aquaculture is accorded high priority and efforts have been made to increase its role by stepping up the individual pond productivity and by encouraging the construction of new ponds and diversification of commodities. The highest priority is given to shrimp culture to balance the decrease of shrimp production caused by the trawl ban.

The role of cooperatives in fisheries has been augmented. State fisheries enterprises were established to function as pioneering enterprises in new undertakings, and as agents of development for the small-scale fisheries.

The results reached since the First Five Year Plan have been encouraging in terms of achieving the development objectives, namely increasing fish production, income of fish producers, fish consumption, foreign exchange earning, and employment opportunities in fisheries. Foreign assistance and international cooperation have a positive role in increasing national capabilities and supporting fisheries development.

1. INTRODUCTION

The Indonesian fisheries has gained significant progress since the First Five Year Development Plan (REPELITA I) which was started in 1969.

Ruined during World War II and completely ignored during the struggle for independence thereafter, fisheries was just a mess consisting of small subsistence type of fishing operations and an insignificant small group of commercial operations when REPELITA I was started.

With lack of capital resources and technical and managerial abilities, efforts have been made to rehabilitate whatever was left, and at the same time to gradually develop a completely new set-up. It was in the light of scarcity of government physical inputs that the private sector has succeeded in recovering and eventually developing into a new economic force in fisheries as an embryo of what later became the large-scale industrial fishery sector. This was facilitated by the introduction of the domestic and foreign capital investment laws.

Stimulated by the growing market of fresh and frozen fish, especially shrimp, mostly intended for export, the medium-scale industry emerged and influenced the orientation of the small-scale fisheries to more commercial motivation. This stage of development coincided with the growing capability of the government to play a more active role in the development of the small-scale fisheries.

Indonesia is endowed with very rich fishery resources, both marine and inland species. With the recent addition of 0.8 mi^2 of exclusive economic zone, the resource potential under her jurisdiction is estimated at 6.1 million tons. Although increasing continuously, the production level reached in 1981 was only 1 869 million tons, or 30% of the total resource potential. Regionalwise however, some fishing grounds are being more or less depleted.

Fisheries is gaining importance as the main source of animal protein for the population, and as a source of living of not less than 2 million fishermen and fishfarmers. Its contribution to the country's foreign exchange earning is also growing by the year. With a population level of 150 million in 1981, the average national fish consumption has just reached 12.4 kg *per caput*/year, with very sharp variations among the island groups.

The income levels among the fishermen and fishfarmers are considered the lowest in the country. Meanwhile the foreign exchange earning from export of fishery commodities increased considerably from US$ 2.8 million in 1968 to US$ 215.8 million in 1981.

The prospect of fisheries development in Indonesia is certainly bright. With the resource potential available and a huge market awaiting just on the doorstep, the most basic factors for having a big fisheries are already in hand.

As one of the potential oil producing country in the region, Indonesia is even in a better position to compete with any other fishing nation in exploiting the exclusive economic zone, if the most appropriate measures could be applied.

2. PAST AND PRESENT DEVELOPMENT POLICIES AND STRATEGIES

2.1 Long-Range Objectives and Philosophical Background

Based on the natural, socio-economical and socio-cultural conditions prevailing in Indonesia, fisheries development has been directed to the achievement of long-range objectives, namely:

(i) To raise the income and standard of living of the small fishermen and fishfarmers.

(ii) To increase the productivity of fishing efforts and boost the national fish production.

(iii) To increase fish consumption of the people.

(iv) To increase exports of fishery products.

(v) To have better control on the utilization and management of fishery resources.

This reflects the national strategy for economic development, called the "TRILOGI" (Three basic principles) consisting of: Equity Growth and Stability, which is envisioned as a higher set-up of the "Growth with Equity" strategy.

The dichotomy existing within the forces exercising fisheries, where millions of small fishermen and fishfarmers are overexploiting the limited resources close to the crowded areas, while on the other side a small but powerful industrial fishing elite is in the capability of access to all the potential resources throughout the country, justifies the above strategy. This option however, has the consequence that growth will not be as fast as technical feasibilities can warrant.

2.2 Small-Scale Fisheries Development

The Government is aware of the importance of the role of the small-scale fisheries in the development of fisheries as a whole, not only because it contributes about 95% to the total national fish production, but the more so because of its socio-economic implications covering around 2 million fishermen and fishfarmers excluding their families. The development of the small-scale fisheries is a complex task, and there is no way to reach a reasonable and thorough result within a short- or even medium-term period. This is particularly true where Government interventions or inputs are required.

As part of the overall national development plan, fisheries has been on a lower priority setting compared with the more strategic sub-sectors such as food-crop production, especially rice. This has the consequence that with the limited resources available, the facilities provided to fisheries development have not been as it should be.

Facilities provided and interventions made by the Government for the development of fisheries in general and the small-scale fisheries in particular consist mainly of: (1) financial assistance; (2) technological development; (3) institutional improvement, and (4) regulatory measures.

Financial assistance is given in the form of loans or indirectly in the form of subsidies. For the small-scale fishermen and fishfarmers special loans are provided, among others:

(a) BIMAS (Mass Guidance) Credit, or Lately Improved into Fishermen and Fishfarmers Credit

This credit is extended to small fishermen and fishfarmers for improvement of fishing vessels and gear and intensification of fish ponds. It does not

require any collateral and has an interest of 12% per year. This credit scheme was introduced to balance the effects of the trawl ban, particularly for shrimp production by small-scale operations.

The maximum loan is equivalent to the value of a 7 GT vessel and gear (now increased to 10 GT) or for the operation of 2 ha of fish pond.

(b) Small Investment Credit

This credit is a predecessor of the BIMAS credit and has the same specifications except that this credit requires collateral.

(c) Working Capital Credit

This credit is intended to supplement the small investment credit with the needed working capital, but it is possible to apply for working capital credit only. The maximum loan is Rp. 10 million with an interest of 12%.

(d) Mini Credit

The loan ranges from Rp. 10 000 to Rp. 200 000 for both investment and working capital, and is provided by State Banks at the village level.

(e) Midi Credit

The loan ranges from more than Rp. 200 000 to Rp. 500 000 and intended for the same purpose as the Mini Credit and is provided by State Banks at the District level.

According to the Government credit policy, all credits should be insured by the Banks to the Indonesian Credit Insurance Corporation which was established in 1979.

Subsidies are given among others through subsidized prices of fuel, fishing materials, fertilizers and pesticides. Due to communication and distribution constraints however, the subsidized prices are not always felt throughout the country.

Technological developments are initiated by the Government through research and development, training and extension work. The activities cover catching and culture techniques and post harvest technologies. The technologies developed are geared to the implementation of development programmes for intensification (or modernization), extensification and diversification of fishing efforts in accordance with local conditions and resource potentialities.

Institutional improvements are particularly geared to promote participation of the community. The group approach is pursued for training and extension activities, while cooperative movements are encouraged to facilitate economic activities at the village level. Professional organizations are also encouraged to participate in the decision-making process covering issues of direct interest to the fishery community.

Regulatory measures are taken by the Government to promote fisheries development toward the rational utilization of fishery resources throughout the country, and in particular to promote the development of the small-scale fisheries.

These include among others re-allocation of fishing areas and limitation of fishing efforts in favour of the small-scale operators.

The development of the small-scale fisheries should in fact be handled as part of an integrated rural development plan. This is because of the fact that the improvement of the fishing effort alone will not have sufficient impact to the betterment of the individual fishing family, let alone to the betterment of the rural community as a whole.

2.3 Marine Fisheries Development

The Indonesian marine waters are not only rich of many varieties of fish stock, but also rich of different kinds of ecosystems found in different parts of the country. The availability of huge continental shelves, the Sunda shelf at the western part and the Sahul shelf at the eastern part of the Indonesian archipelago, make both demersal and pelagic fishing possible, while many parts of the inter-island seas and the surrounding exclusive economic zone have deep waters very rich of migratory species such as skipjack and tuna.

The demographic condition of the country where most of the population is concentrated on the western part of the archipelago, and consequently most of the fishermen are also operating along the shores of the relatively shallow Sunda shelf, present the fact that the utilization of the fishery resources has been distributed quitè unevenly. Eightythree percent of the total fishermen and 77% of the total fishing vessels are found on the western part of the country.

The eastern part of the Indonesian waters and the offshore and deep sea fishing grounds including the exclusive economic zone have been beyond the reach of the small-scale fishermen, and consequently have been underutilized.

The above mentioned geographic, hydrographic and demographic conditions, paired with the socio-technological condition of the small-scale fishermen form the basis for the policy drawn for the development of the marine fisheries in Indonesia. Within this policy the western waters of the archipelago are reserved for the development of the small-scale fisheries, with the exception of the offshore and remote areas where temporarily the medium-and large-scale fisheries are still allowed to carry out fishing. The eastern waters of the country are open for large-scale fishing operations.

To protect the small inshore fishermen from other fishermen using more sophisticated fishing methods, the government introduced fishing zones parallel to the coastline. The fishing zones starting from the most close to the coastline are respectively 3 mi, 4 mi and 5 mi in width, and are closed for mechanized fishing boats of more than 5 GT, 25 GT and 100 GT respectively. The restriction also covers certain fishing gears of certain sizes considered too effective for the respective zones. The zoning however, is only limited to the densely fished areas, mainly on the western part of the country.

To better control the allocation of the demersal resources, particularly among the trawl fisheries, another regulatory measure was taken. With this regulation the marine waters of the country was divided into four fishing areas, and according to the estimated resource potential of each area, the maximum number of trawlers was allocated.

Following this procedure, only about 3 000 trawlers of different sizes were set as the maximum for the whole country. For practical purposes the four fishing areas were sub-divided into more controlable sub-areas. The implementation of resource allocation as mentioned above is coupled with a system for issuing fishing licenses. In Indonesia fishing licenses are issued by the provincial governments, except for large-scale enterprises operating under the Foreign Capital Investment Law and the Domestic Capital Investment Law which are handled by the central government.

Although quite an ideal set-up, the implementation of the two regulatory measures has only limited success. The difficulty in enforcing and controlling the implementation at sea lead to many violations with all the negative consequences.

This happened with the management of trawl fishing in Indonesia, and after desperate efforts to control the situation, the government has come to the decision of banning trawl fishing completely but divided into four phases. The first phase started on 1 October, 1980 for trawlers around Java and Bali; the second phase started on 1 January, 1981 for trawlers around Sumatra ; the third phase started on 1 July, 1981 with the target of reducing the number of the remaining trawlers to 1 000 vessels outside Java, Bali and Sumatra , while the last phase is planned to be started on 1 January, 1983, when all the remaining trawlers will be completely banned.

The government's decision to ban trawl operations has three main objectives, namely: (1) to facilitate better resource management; (2) to stimulate the growth to the traditional small-scale fisheries; (3) to prevent social friction and unrest. There was no intention whatsoever to force the trawl owners out of the fishing business. The trawl owners were given the opportunity to continue their fishing operations by using fishing gears other than trawl nets of any kind. Credit facilities were provided to make the necessary modification of the vessels and the purchase of new fishing gears.

Besides that, two other options were given to the trawl owners, if they were not in the position to continue fishing on their own. The first option is to establish a joint operation with their crew fishermen, where the fishermen through a credit provided by the government will have the share on fishing gear and working capital. The second option is to sell the vessel to the government, in which case the government will give the vessel to fisheries cooperatives or fishermen groups on an installment basis.

To the trawl fishermen who did not have the opportunity to continue working on one of the converted trawl vessels, opportunity was given to obtain a collective loan for starting a new fishing operation using small motorized vessels for catching shrimp with gillnets or trammel nets.

The depletion of resources in inshore waters creates problems to the development of the small-scale inshore fishermen. Credit facilities to improve their fishing capabilities normally are not sufficient to bring them to the offshore waters, resulting to more overfishing in the inshore waters. To overcome this situation, the Government is increasing the maximum limit of the small-credit scheme to cover bigger boats, even if it should be owned and operated by a group of fishermen.

As a first opportunity for modernizing their fishing vessel, the small fishermen usually turn themselves to outboard motors as the most immediate choice within their reach.

Although felt as a significant improvement compared with their non-mechanized operations, it becomes in the long run less and less profitable. This is among others caused by the increase of fuel prices, especially when gasoline is used.

The Government is aware that the overcrowding of small-scale fishermen in limited fishing areas as it prevails along the north coast of Java, east coast of Sumatra and the coast of South Sulawesi, cannot be tolerated indefinitely. To solve this problem the government is encouraging the development of offshore and deep sea fishing, where gradually the small inshore fishermen are expected to join, either as independent fishermen groups or employed by cooperatives or entrepreneurs. To achieve this objective the government is extending loans for medium-scale operators and provides infrastructure facilities and assistance to facilitate the marketing of the catch.

The development of the large-scale industrial fisheries has been directed to the utilization of the potential fishery resources outside the reach of the small-scale fishermen, particularly on the eastern part of the country. The industrial fisheries is mainly directed to produce commodities for export to increase foreign exchange earning of the country. For this purpose the main commodities aimed at are shrimp, skipjack and tuna. The policy indicated above has been made to limit the possibility of competition with the small-scale fisheries, as well as to limit the adverse effect to the domestic consumption of fish. On the contrary as much as possible benefit should be generated for the small-scale fisheries by the demonstration effects of the technologies applied and the infrastructure facilities which can be benefitted by the small-scale fishermen. Some of the large-scale fisheries enterprises are even allowed to buy fish from the small-scale fishermen to help them market their catch at better prices.

The strategy of using large-scale industrial fisheries in helping the development of the small-scale fisheries has generally been assessed as being successful. This has been for the major part because resource potentials still warrant the growth of both the small- and the large-scale fisheries. The strategy has even been developed into a nucleus-estate-smallholder (NES) concept. In this set-up a large-scale fisheries enterprise, usually a

state-owned enterprise is providing technical assistance to the small-scale fishermen in the surrounding area, and assists them in the marketing of their catch. Right now six state-owned fisheries enterprises are acting as nucleus in the NES set-up.

2.4 Inland (Capture) Fisheries Development

Indonesia has large inland water bodies, especially outside Java. Many economically valuable fish species are found in those waters, providing an opportunity for fishing activities to the local population. Since the fishing grounds are usually remote, infrastructure facilities almost non-existant, and the population quite scarce, the fishing operations are usually just for subsistence purposes or for local consumption. In the vast marshes of Kalimantan, some concentrations of fishing efforts provides sufficient amount of fish catch, which after being salted and dried are sent to Java.

With the rapid development of forest industry in Kalimantan and the resultant diversion of local labour to that industry, a drastic reduction of the total output of the island's important inland fisheries has occurred. The situation has improved somewhat during the last few years, but the production level reached before has not been recovered.

Contrary to marine capture fisheries, inland capture fisheries did not attract significant investments. Small investors are more interested in collecting fish from the small-scale fishermen, mostly salted and dried, but recently also fresh and live fish and shrimp.

Basically the Government is attaching the same importance to this sector of fisheries. All facilities such as credit schemes and subsidies are equally valid to this sector, but the nature of the undertaking, remoteness of area, lack of infrastructure and institutional back-up, do not make the facilities effectively available to the fishermen.

The problem of resource management is already serious in certain areas. To protect the fish stock, the Government established conservation areas where fishing is prohibited the whole year round or for certain seasons of the year. In areas where the fish stock is already depleting, restocking programmes are carried out to recover the resource potential. At the big lakes in Sumatra and Sulawesi, special hatcheries were built to serve the restocking programmes.

2.5 Aquaculture Development

Aquaculture activities consist of brackishwater culture, freshwater culture and rice-cum-fishculture. Cage culture in streams are popular in certain areas. Mariculture and the more sophisticated "aquaranching" in open waters are still in the developmental stage.

Almost all the aquaculture activities are small-scale in nature, with an average of 2.9 ha per holding for brackishwater culture and 0.1 ha per holding for freshwater culture. About 95% of the aquaculture activities (by area under culture) are concentrated in Java, Sumatera and Sulawesi, the most heavily populated islands of Indonesia.

Aquaculture development is carried out through three main activities, namely: intensification, extensification and diversification. Intensification is geared to increase productivities of the existing activities through some combination of sophistication covering pond engineering, stock manipulation, fertilization, pest control and management.

Extensification implies the construction of new ponds or other aquaculture devices, using either less sophisticated technology or directly intensive methods, while diversification relates to the culture of other species besides those traditionally grown before.

Brackishwater culture which traditionally aimed at milkfish (*Chanos chanos*) as the main species cultured, are now being directed to growing shrimp, either as a single commodity or mixed with milkfish. The intensification of shrimp culture has been made possible with the successes made in shrimp breeding. The government supports the development and financing of small-scale hatcheries which can be owned and operated by village cooperatives. To safeguard the supply of brackishwater at the prescribed quantity and quality, the government assists in constructing and rehabilitation of irrigation canals to the brackishwater ponds.

Freshwater culture consists mainly of stagnant water pond culture and running water pond culture, besides rice-cum-fish culture at irrigated rice fields. The Government is providing assistance for the production of fish and shrimp fry. Government owned hatcheries are found in all provinces where freshwater culture is exercised by the people. This is to supplement the small hatcheries operated by small breeders. Between the small breeders, the rice-cum-fish farmers and the running water ponds owners in certain areas a harmonious cooperation exists, where the small breeders provide fish fry to the rice-cum-fish farmers to be grown to juveniles of about 100 g each, which is just the right size to be sold to the running water pond operators, where they will be grown to the required size for direct consumption. If needed as an additional function the running water ponds can also be used as a source of providing good quality brood stock by selecting the best fishes among the whole population.

Although still at the developmental stage, the Government is attaching high importance to the development of mariculture activities, in view of the productive employment opportunities that can be created for the coastal fishermen and their families, and potential production increases that can be expected. For the orderly conduct of mariculture activities, the Government provides guideline policies relating to the parties allowed to this business, coordination with other coastal water users, and resource management measures. Except for operations needing sophisticated technology (such as pearl culture, etc.) all mariculture activities should be carried out by village cooperatives.

3. SUPPORTING AND INSTITUTIONAL BACK-UP

One of the main objectives of fisheries development is to raise the income and standard of living of the small-scale fishermen and fishfarmers by increasing their productivities, and obtaining the most profitable market value from their products. The market value of fishery products is mainly determined by the marketing set-up, and the demand for fish.

Fish marketing is generally still unorganized. The role of money-lenders functioning at the same time as middle-men is still dominant everywhere, especially where infrastructure facilities are still very scarce. Although their function as the only channel for disposing of the fish catch in many remote areas should be recognized, the role of the middle-men needs to be rectified.

To solve this problem, the role of cooperatives has been intensified, not only to strengthen the fishermen and fishfarmers in coping with their production problems, but also to deal with post-harvest activities. At the landing sites many village cooperatives are entrusted to manage fish auctions. Some cooperatives also have ice plants or chilling rooms for storing excess fish when the market cannot absorb the daily landings at profitable prices. All this helps to strengthen the bargaining position of the fishermen. It should be admitted however, that very much has still to be done to improve the capabilities of the village cooperatives, especially in the remote areas.

For the marketing and distribution of fish to more distant areas, besides the central cooperatives at the provincial level which in certain areas already start to have some share, the Government assigned state fisheries enterprises to establish a sound organized marketing set-up as part of their overall functions. The functions of the state fisheries enterprises are: (1) to act as a pioneering enterprise in utilizing fishery resources which does not yet attract private investment; (2) to act as an agent of development for the small-scale fisheries, and (3) to accelerate the creation of national cadres in modern fisheries management. Out of the six state fisheries enterprises, five are already functioning quite well.

To facilitate fish marketing, the Government has constructed 25 fishing ports and upgraded 145 fish landing places, scattered all over the country. The components supporting fish marketing are auction halls, ice plants and chilling rooms.

4. ACHIEVEMENT OF OBJECTIVES

With the limited fund and facilities available and with the priority setting on the development of the small-scale fisheries, where the objective of obtaining equity is more important than of obtaining growth, the results achieved since REPELITA I could be regarded as quite satisfactory.

Fish production has increased constantly. Being 1 159 million tons in 1968, it became 1 869 million tons in 1981; an average increase of 3.7% per year. The highest increase came from the marine fish capture, increasing at an average of 5.1% per year. Aquaculture fell second with an increase of 5.0% per year, while open water fish capture decreased with an average of 1.5% per year.

The income growth of the fishermen and fishfarmers has shown encouraging results.. According to socio-economic surveys carried out in 1975 and 1980 among marine fishermen along the north coast of Java, incomes of fishermen increased progressively both by time and by the technological inputs applied. At the average, 1980 incomes were two times higher than those from 1975, calculated at constant values.

Since in 1980 relatively more fishing households were using technological inputs compared with 1975, it could be concluded that the number of fishermen receiving better incomes were also increasing during that period.

Fish consumption also increased constantly. The national average increased from 10.3 kg *per caput*/year in 1968 to 12.4 kg *per caput*/year in 1980. The distribution of the *per caput* consumption was however quite unbalanced. Using 1980 figures the *per caput* fish consumption by island groups were 42.2 kg in Kalimantan, 31.6 kg in the Moluccas and Irian Jaya, 29.3 kg in Sulawesi, 19.8 kg in Sumatra , 8.1 kg in Nusatenggara and Bali, and 5.9 kg in Java. About 62.2% of the mid-class 1980 population lived in Java.

Exports of fishery products increased from a value of US$ 2 822 million in 1968 to US$ 221 356 million in 1981, an average increase of 39.9% per year. Using 1981 figures, the main export items consisted 73.6% (by value) of shrimp, 7.0% of tuna and skipjack, and 2.6% of other species of fresh marine fish. Shrimp exports decreased somewhat in 1980 and 1981 as the result of the trawl ban started in late 1980.

Employment in fisheries has shown some indications of increase. The 1973 Fishery Census and the 1980 Population Census revealed that the number of fishing operator's households and fishing labourer's households on the north coast of Java increased from 153 696 in 1973 to 191 079 in 1980.

It was also revealed that the number of fishing operator's households decreased while the number of fishing labourer's households increased during the same period. This indicates that many of the small-scale fishing operator's households tend to shift to fishing labourer's households working for larger-scale fishing units, showing a certain trend of shifting or transformation of the fisheries structure to much bigger units.

5. ROLE OF FOREIGN ASSISTANCE AND INTERNATIONAL COOPERATION

Foreign assistance is particularly intended to strengthen the national capabilities in supporting fisheries development in the country. It is also regarded as a supplement to national inputs to accelerate development.

Based on the government's functions in fisheries development, foreign assistance since REPELITA I was particularly directed to the following areas:

(1) Assessment of fishery resources;

(2) Development of appropriate technologies;

(3) Training of skilled manpower;

(4) Establishment of a suitable extension system;

(5) Identification of project sites and feasibility studies;

(6) Implementation of piloting and pioneering fishing operations;

(7) Financial assistance to small fishermen and fishfarmers.

All the areas mentioned above have to some extent been covered by one or more foreign assistance and financial aid since REPELITA I.

Resource surveys have been carried out in the Java Sea and the eastern part of the Indian Ocean for both pelagic and demersal stocks with the assistance of FAO/UNDP and the Federal Republic of Germany. Limited resource surveys are being carried out around some of the Natuna Islands in the South China Sea and around the Sangihe Islands in the Sulawesi Sea with the assistance of CIDA-Canada and FAO. Mariculture resource surveys have been carried out with FAO/UNDP assistance.

The development of appropriate technologies has been concentrated on brackishwater fish and shrimp culture with the assistance of FAO/UNDP. Other sectors have not yet been covered intensively, although as part of the training and extension projects the application of better fish capture in marine fisheries and freshwater culture techniques have also been carried out.

Training of skilled manpower has been mainly concentrated on marine fisheries with the assistance of FAO/UNDP. The project covered one main training centre in Java and five outstations outside Java. Training of government's personnel such as research workers, scientists, technicians and extension workers however, has been covered by almost every assistance projects as a training component of the projects.

The establishment of a suitable extension system on a pilot scale is the objective of the latest FAO/UNDP assisted project. The project covers four provinces with dominant marine fisheries activities and one province with dominant freshwater fishculture activities.

Identification of project sites and feasibility studies have usually been carried out as part of the activities of foreign assisted projects, either national or regional in nature. International Banks such as the World Bank and the Asian Development Bank also provide assistance for this purpose, connected with future bank loans to finance the projects if found feasible.

The implementation of piloting and pioneering fisheries projects is usually carried out through bank loan financing. Six projects which eventually have become state-owned fisheries enterprises have been established, three projects were financed by ADB, two projects by the World Bank and one project by OECF-Japan.

Financial assistance to small fishermen and fishfarmers were and are being obtained from the World Bank and the Asian Development Bank. These kind of assistance are normally extended to the fishermen or fishfarmers as sub-loans through state banks. Some of the loans are extended as a supplement to the existing domestic credit scheme.

The impact of the foreign assistance is very positive, and in some areas the national capabilities have been improved considerably and can continue without much additional assistance. In terms of sectoral coverage and geographical distribution however, the work done is still very limited and much more has still to be accomplished.

Experiences gained from the implementation of projects, either national or foreign assisted projects, have shown that particularly for the development of the small-scale fisheries more appropriate technologies could be learned from developing, neighbouring countries. Based on these experiences more and more TCDC activities were carried out, either by sending people to neighbouring countries to study practical things which are more developed in that particular country or by accepting more experts from the region to fill certain posts in foreign assisted projects.

The need and opportunity to cooperate among neighbouring countries will be more intense in the future, especially within the framework of the new law of the sea. The extensive fishing areas gained as the consequence of the exclusive economic zone place some neighbouring countries to a situation where bilateral or regional cooperations are inevitable. This covers among others the management of stocks distributing beyond the boundaries of two or more states, and the setting-up and implementation of a monitoring, control and surveillance system.

6. IDEAS FOR NEW STRATEGIES AND APPROACHES

Based on past and present experiences, and considering new developments within and outside the country having bearing to fisheries, the following ideas for new strategies and approaches deserve serious consideration:

(a) To accelerate the rational utilization of fishery resources throughout the Indonesian waters, including the EEZ, and to relieve the excess pressure to some of the inshore waters as soon as possible, new incentives should be devised to attract the inshore fishermen to offshore or even deep sea fishing. The role of state fisheries enterprises as agents of development to this end could still be utilized.

(b) The implementation of an integrated rural development, covering all sectors including fisheries, should be in a concerted action within an integrated rural development programme, in the sense that all development activities should be planned and implemented as one entity under one coordinated management. To be effective, the concerted action should not cover a too wide area at one time, and should be in accordance with the availability of inputs needed for all sectors.

(c) The allocation of fishery resources to different fishing groups and its enforcement need an effective enforcement machinery, where the agency responsible for fisheries development should at least be the main component and given the main responsibility. To facilitate compliance to such management measures, the resource allocation should be based on more easily identifiable criteria.

(d) To face the ever increasing labour force which eventually will compete for the same and limited resources, new employment opportunities should be created. Some potential areas are among others rural cottage industry and mariculture or seafarming.

(e) In view of the increasing interdependency of coastal states in the management and development of fishery resources in the region, the need to give more authority to regional bodies in carrying out management measures become more apparent. This can be achieved if a management measure adopted and recommended by a regional body is accepted and enforced by all member countries who do not specifically object to it.

APPENDIX 1

Fisheries Production by Sub-sector, 1969-1981

Unit: 1 000 t

Sub-sector	1968	1973	1978	1979	1980 a/	1981 b/	Average annual increase (%)
Total	1 159.0	1 277.5	1 647.7	1 748.4	1 849.7	1 869.2	3.7
1. Marine fishery	722.5	888.5	1 227.4	1 317.7	1 394.8	1 387.4	5.1
2. Inland fishery	436.5	389.0	420.3	430.7	454.9	481.8	0.8
2.1 Open water	320.4	249.6	249.1	248.2	254.5	261.6	1.5
2.2 Culture	116.1	139.4	171.1	182.5	200.4	220.2	5.0
- Brackishwater pond	43.5	60.5	88.0	93.6	97.9	103.4	6.9
- Freshwater pond	53.3	51.9	57.7	59.4	66.4	73.1	2.5
- Cage	0.2	0.3	0.4	0.4	0.6	0.7	10.1
- Paddy field	19.1	26.7	25.1	29.1	35.5	43.0	6.4

a/ Revised figure

b/ Preliminary figure

APPENDIX 2

Number of Marine Fishermen and Fishing Boats, 1980 a/

Island	Fishermen		Fishing boats	
Total	970 731	(100%)	271 856	(100%)
Sumatra	196 686	(20.3%)	53 494	(19.7%)
Java	310 943	(32.0%)	66 329	(24.4%)
Bali - Nusatenggara	72 463	(7.5%)	28 723	(10.6%)
Kalimantan	86 834	(8.9%)	18 772	(6.9%)
Sulawesi	212 391	(21.9%)	70 469	(25.9%)
Maluku - Irian	91 414	(9.4%)	34 068	(12.5%)

a/ Revised figure

APPENDIX 3

Area Under Culture, 1980[a/]

Unit: ha

Island	Brackishwater pond		Freshwater pond		Cage		Paddy field	
Total	188 601	(100%)	38 501	(100%)	2	(100%)	88 942	(100%)
Sumatra	26 634	(14.1%)	10 739	(27.9%)	-		14 208	(16.0%)
Java	99 156	(52.6%)	22 773	(59.1%)	1	(50%)	54 923	(61.8%)
Bali - Nusatenggara	2 956	(1.6%)	864	(2.2%)	-		12 653	(14.2%)
Kalimantan	1 111	(0.6%)	790	(2.1%)	1	(50%)	-	
Sulawesi	58 743	(31.1%)	3 190	(8.3%)	-		7 158	(8.0%)
Maluku - Irian	1	(0.01%)	145	(0.4%)	-		-	

a/ Revised figure

APPENDIX 4

Volume of Export of Fisheries Products, 1968-1981

Unit: t

Commodity	1968	1973	1978	1979	1980 a/	1981 a/	Average annual increase (%)
Total	19 717	52 178	63 485	68 264	78 705	75 168	10.8
Shrimp	2 902	28 787	32 620	34 743	31 934	24 971	18.0
Tuna/Skipjack	...	...	9 426	9 797	11 139	14 013	14.1
Marine fish, others	3 416	5 868	4 202	6 712	20 169	15 301	12.2
Frog	-	2 867	2 325	2 657	1 612	2 778	-0.4
Jelly fishes	-	1 935	1 860	1 436	1 474	3 088	6.0
Ornamental fish	23	286	359	399	473	364	23.7
Others	13 376	12 435	12 693	12 520	11 904	14 653	0.7

a/ Revised figure

APPENDIX 5

Value of Export of Fisheries Products, 1968-1981

Unit: FOB US$ 1 000

Commodity	1968	1973	1978	1979	1980 a/	1981 a/	Average annual increase (%)
Total	2 822	68 185	193 424	236 827	226 354	221 356	39.9
Shrimp	824	57 562	161 955	200 483	180 904	162 827	50.2
Tuna/Skipjack	...	...	6 193	8 003	12 900	15 416	35.5
Marine fish, others	512	678	1 574	2 227	6 473	5 746	20.4
Frog	-	3 774	6 236	7 184	4 754	9 430	12.1
Jelly fishes	-	1 617	3 982	2 651	2 008	5 196	15.7
Ornamental fish	33	56	96	114	136	115	10.0
Others	1 453	4 498	13 388	16 165	19 179	22 626	23.5

a/ Revised figure

APPENDIX 6

Volume of Import of Fisheries Products, 1968-1981

Unit: t

Commodity	1968	1973	1978	1979	1980 a/	1981 b/	Average annual increase (%)
Total	2 521	7 732	27 099	31 018	39 517	58 989	27.4
Fish, processed (dried salted, smoked)	1 883	180	36	16	92	20	-29.5
Fish, canned	596	7 140	7 528	2 556	1 763	1 080	4.7
Fish oil	12	296	303	237	189	248	26.2
Crustaceans and Mollusca	-	15	21	44	52	97	42.2
Agar-agar	6	55	96	62	159	41	15.9
Fish meal (unfit for human consumption)	-	-	18 948	27 957	34 194	50 341	130.0
Others	24	46	167	146	3 068	7 162	55.0

a/ Revised figure

b/ Preliminary figure

APPENDIX 7

Value of Import of Fisheries Products, 1968-1981

Unit: Cif US$ 1 000

Commodity	1968	1973	1978	1979	1980 a/	1981 b/	Average annual increase (%)
Total	507	2 463	10 029	6 716	20 971	37 133	39.1
Fish, processed (dried, salted, smoked)	283	41	23	58	31	54	-12.0
Fish, canned	194	2 022	6 662	2 105	2 438	3 429	24.7
Fish oil	4	277	240	264	298	273	38.4
Crustaceans and Mollusca	-	22	88	264	194	780	66.9
Agar-agar	4	59	557	393	848	273	38.4
Fish meal (unfit for human consumption)	-	-	2 247	3 338	15 997	31 654	121.9
Others	22	42	212	294	1 165	670	30.1

a/ Revised figure

b/ Preliminary figure

APPENDIX 8

Income per caput of Fishing Operator's Households and Fishing Labourer's Households in Marine Fisheries on the North Coast of Java, 1975 and 1980

(Thousand Rupiah)

Scale of undertaking				1975 a/	1980
Fishing operator's household	Total			66.6	126.5
	Small holder fisheries	Without boat		31.7	59.1
		With non-powered boats	Canoe	51.5	88.2
			Small boat	61.2	85.8
			Medium boat	55.3	132.4
			Large boat	127.5	125.3
		Outboard motor		142.6	362.2
	Medium scale fisheries	With powered boats	Sub total	235.5	1 033.5
			< 10 GT	...	279.3
			10 - 50 GT	....	1 027.4
			50 - 200 GT	...	3 259.8
			≥ 200 GT	...	18 766.0
Fishing labourer's household				45.1	65.0

a/ Adjusted with increase of living expenditures in Jakarta, Semarang and Surabaya from May 1975 to April 1980 totalling 94.3%.

APPENDIX 9

Number of Fishing Operator's Households and Fishing Labourer's Households on the North Coast of Java in 1973 and 1980

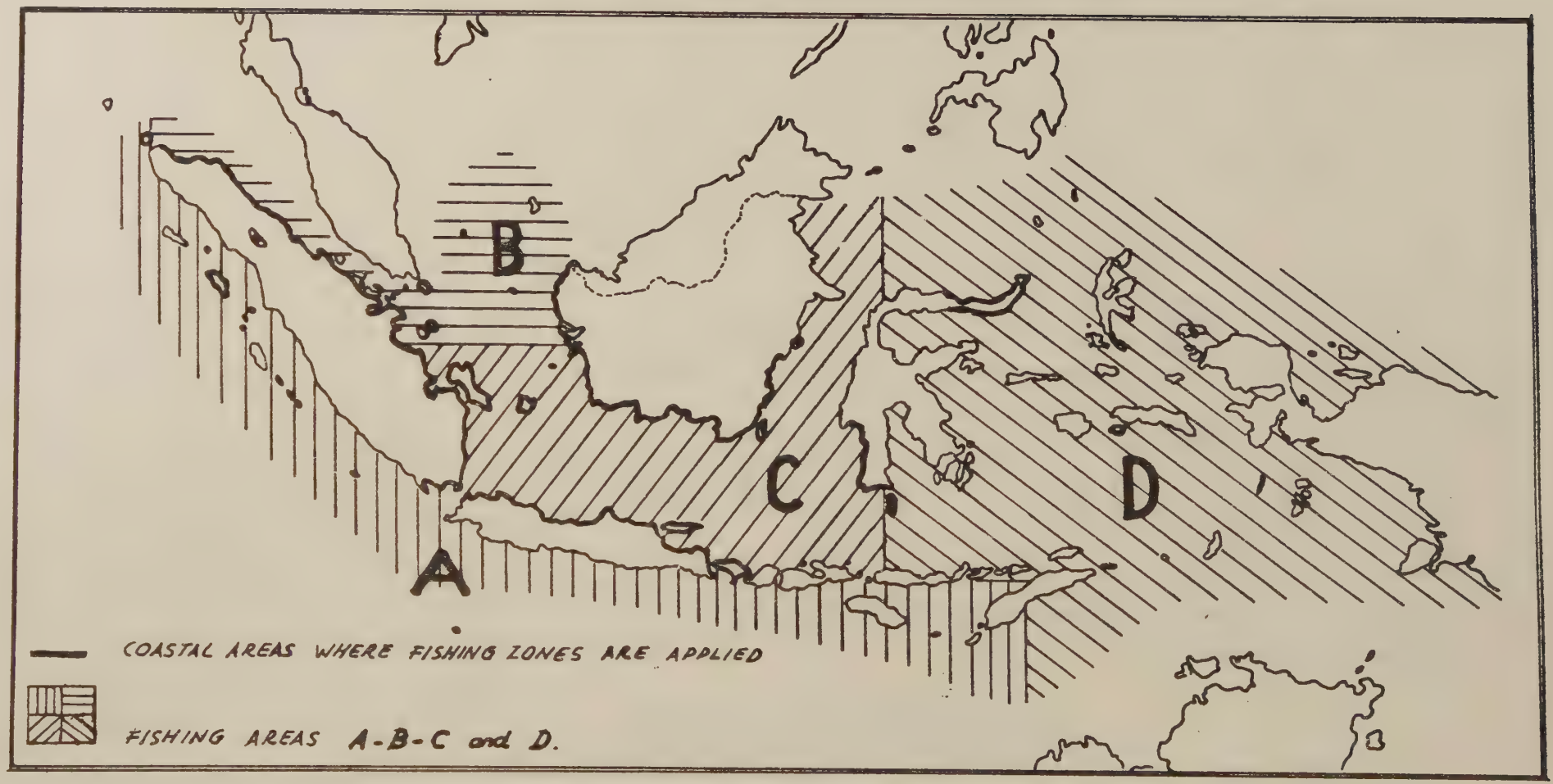
Status	1973 a/		1980 b/		Annual increase (%)
	Total	(%)	Total	(%)	
Fishing operator's household	110 640	(72.5)	60 128	(31.5)	-8.3
Fishing labourer's household	42 056	(27.5)	130 951	(68.5)	+17.6
Total	152 696	(100)	191 079	(100)	+3.3

a/ 1973 Fisheries Census

b/ 1980 Population Census

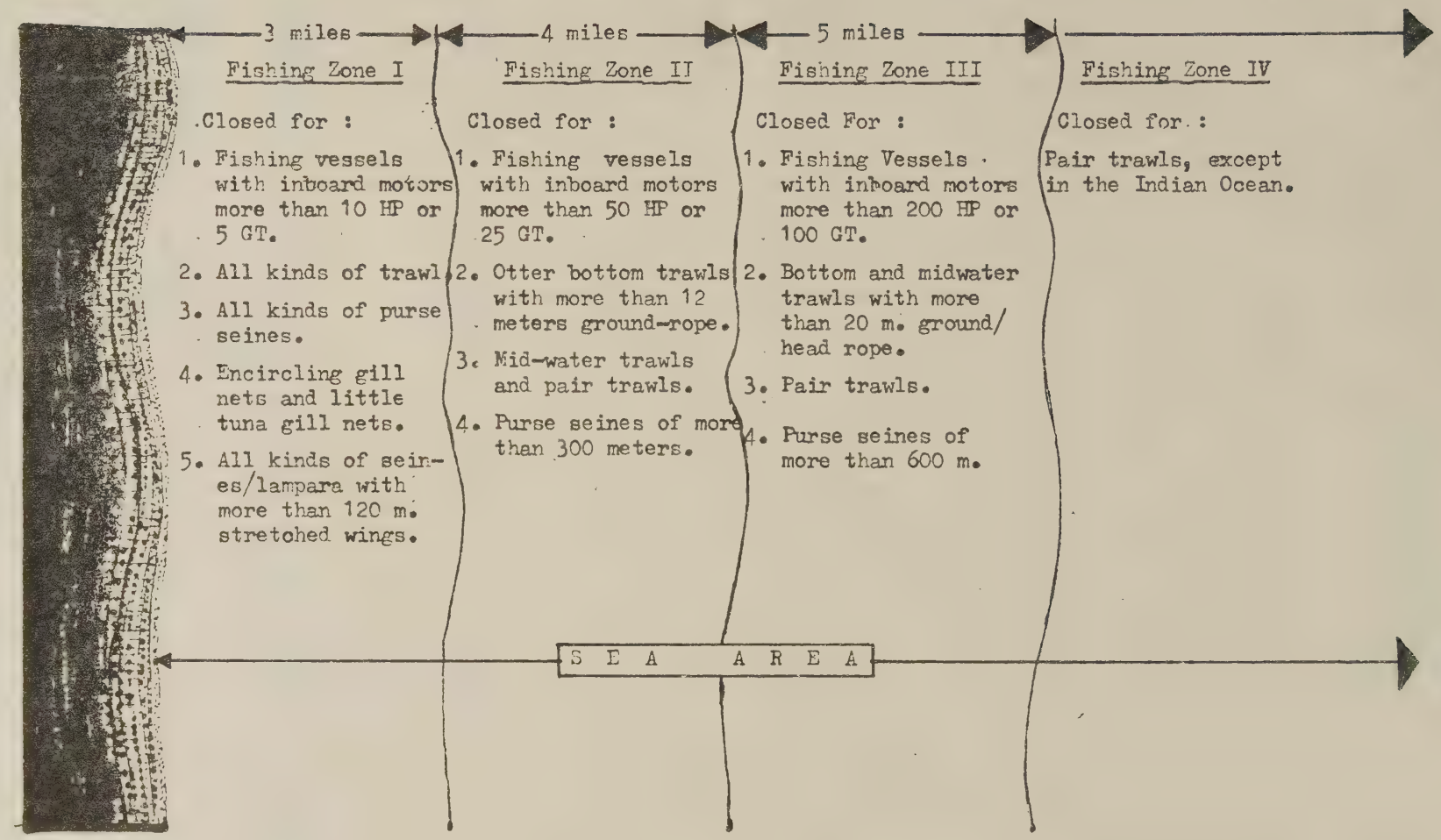
APPENDIX 10

Fishing Zones and Fishing Areas in Indonesia



APPENDIX 11

Fishing Zones Regulation in Indonesia


3 miles
4 miles
5 miles
Fishing Zone I
Closed for :
1. Fishing vessels with inboard motors more than 10 HP or 5 GT.
2. All kinds of trawl
3. All kinds of purse seines.
4. Encircling gill nets and little tuna gill nets.
5. All kinds of seines/lampara with more than 120 m. stretched wings.
Fishing Zone II
Closed for :
1. Fishing vessels with inboard motors more than 50 HP or 25 GT.
2. Otter bottom trawls with more than 12 meters ground-rope.
3. Mid-water trawls and pair trawls.
4. Purse seines of more than 300 meters.
Fishing Zone III
Closed For :
1. Fishing Vessels with inboard motors more than 200 HP or 100 GT.
2. Bottom and midwater trawls with more than 20 m. ground/head rope.
3. Pair trawls.
4. Purse seines of more than 600 m.
Fishing Zone IV
Closed for :
Pair trawls, except in the Indian Ocean.
SHORE
S E A A R E A

THE EXPERIENCE OF JAPAN IN IDENTIFYING AND IMPLEMENTING FISHERY DEVELOPMENT POLICIES AND STRATEGIES CASE STUDY

by

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ABSTRACT

Japan presently maintains an annual catch level of about 11 million tons. In this paper, I will focus on the measures which Japan's fishing industry has taken to cope with the sharp rise in fuel costs stemming from two successive oil shocks and the movement toward the 200 mile era since 1977 as well as certain other problems currently facing our industry.

I shall discuss the historical stages of our fishery development, emphasizing the fact that this development was the result of a long history of over 2 000 years, a vast accumulation of knowledge, a progressive development of fishery policies fitting the needs of each development stage, a stage-by-stage build-up of laws and regulations, and the fact that fishery development responded to the socio-economic conditions of each era in a form answering to the nation's requirements.

Developing nations, when planning fishery development, have a tendency to prematurely introduce high technology and large-scale fisheries. But I will point out need to develop fisheries on a staged, gradual basis, taking into account nutritional levels, consumer tastes, and traditional diet and gearing this development to the economic dynamics of the particular country as well as the degree of refinement of its distribution and processing facilities along with its socio-economic infrastructure.

1. BRIEF DESCRIPTION OF THE PAST, PRESENT, AND PROSPECTIVE SITUATION OF FISHERIES IN JAPAN, IN PARTICULAR, IN THE LIGHT OF RECENT EVENTS AND FACTORS, SUCH AS THE LAW OF THE SEA, THE FUEL CRISIS, ETC.

1.1 Profile of Japan's Fishing Industry

Although the catch proportions among coastal, offshore and deep-sea fisheries and among target species have varied from year to year, the total annual catch level of Japan's fishing industry in recent years has managed to hold at around the 11 million ton level, making us the world's leading fishing nation.

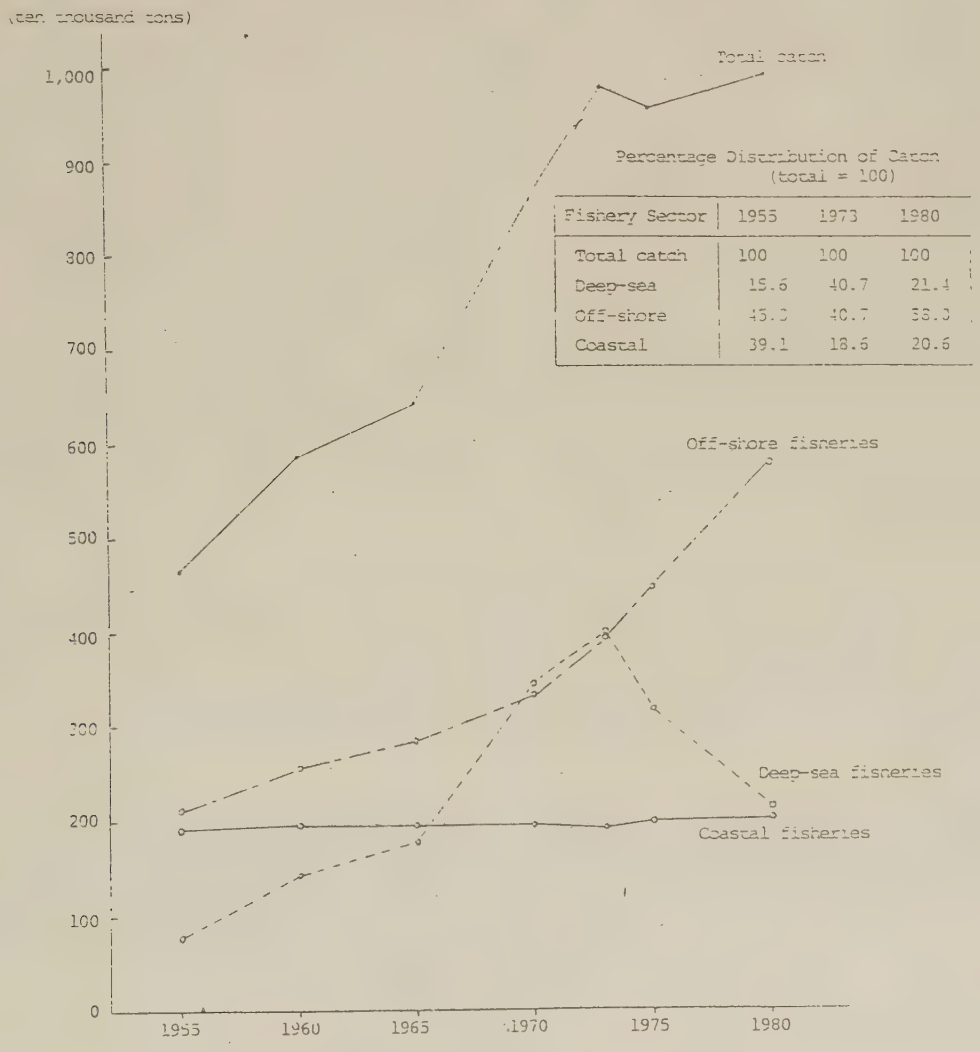
Our fishing industry may be divided into three sectors: (i) coastal fisheries, using handline, longline, gillnet, haulnet and small-size vessels together with set-net, and aquaculture; (ii) offshore fisheries, using various fishing methods, such as trawling, seining, drift nets, and pole and line and operating mainly within Japan's 200 mile zone; and (iii) deep-sea fisheries, employing longline, bottom trawl, drift net, and pole and line, operating mainly outside of Japan's 200 mile zone.

Target species are quite varied, including: species that are caught in coastal and offshore waters, such as sardines, mackerel, saury, jack mackerel, and yellowtail; and those taken in offshore and distant waters, such as salmon, flounder, Alaskan pollock, tunas, and skipjack.

1.2 Changes in Japan's Fisheries with the Advent of the 200 Mile Era

Our fishing industry has been subjected to various changes since the start of the 200 mile era in the late 1970's. These changes have related to fishery production, consumption patterns for fishery products, fish processing, and foreign trade in fishery products.

The primary change has been in relation to fishing grounds, which has in turn led to changes in the level and species composition of our catches. During the first half of the 1970's, the catch level of our deep-sea fisheries had reached approximately four million tons annually, with three million tons of this total accounted for by Alaska pollock taken off both the US and USSR. However, with the establishment of 200 mile zones by these countries in the mid-seventies the catch by our deep-sea fishery began to decline in just three short years, from 1975 to 1978, from 3 168 000 t to 2 134 000 t. But, thanks to a sharp compensating increase in the catch of sardines from our coastal and offshore waters (from 862 199 t in 1975 to 2 441 961 t in 1980), we have been able to sustain our annual catch level at the 10 million ton level.



Percentage Distribution of Catch
(total = 100)

Fishery Sector	1955	1973	1980
Total catch	100	100	100
Deep-sea	15.6	40.7	21.4
Off-shore	45.3	40.7	58.3
Coastal	39.1	18.6	20.6

Trends in Japan's fish catch by fishery sector

Note: Total production in 1980, including culture fisheries and inland waters fisheries, was 11 120 000 t

Composition of Japan's fishery production prior to and following the start of the 200-mile era

1. Production trends

(1 000 t (%))

Year	Deep-sea fisheries	Offshore fisheries	Coastal fisheries	Total
1973	3 988 (40.7)	3 984 (40.7)	1 820 (18.6)	9 793 (100.0)
1980	2 121 (21.4)	5 751 (58.0)	2 037 (20.6)	9 909 (100.0)

2. Production trends by species

	1973	1980
Alaska pollock	3 021 (30.8)	1 552 (15.7)
Mackerel	1 135 (11.6)	1 301 (13.1)
Sardines	731 (7.5)	2 442 (24.6)
Flounders	389 (4.0)	289 (2.9)
Tunas	342 (3.5)	378 (3.8)
Total (including other species)	9 793 (100.0)	9 909 (100.0)

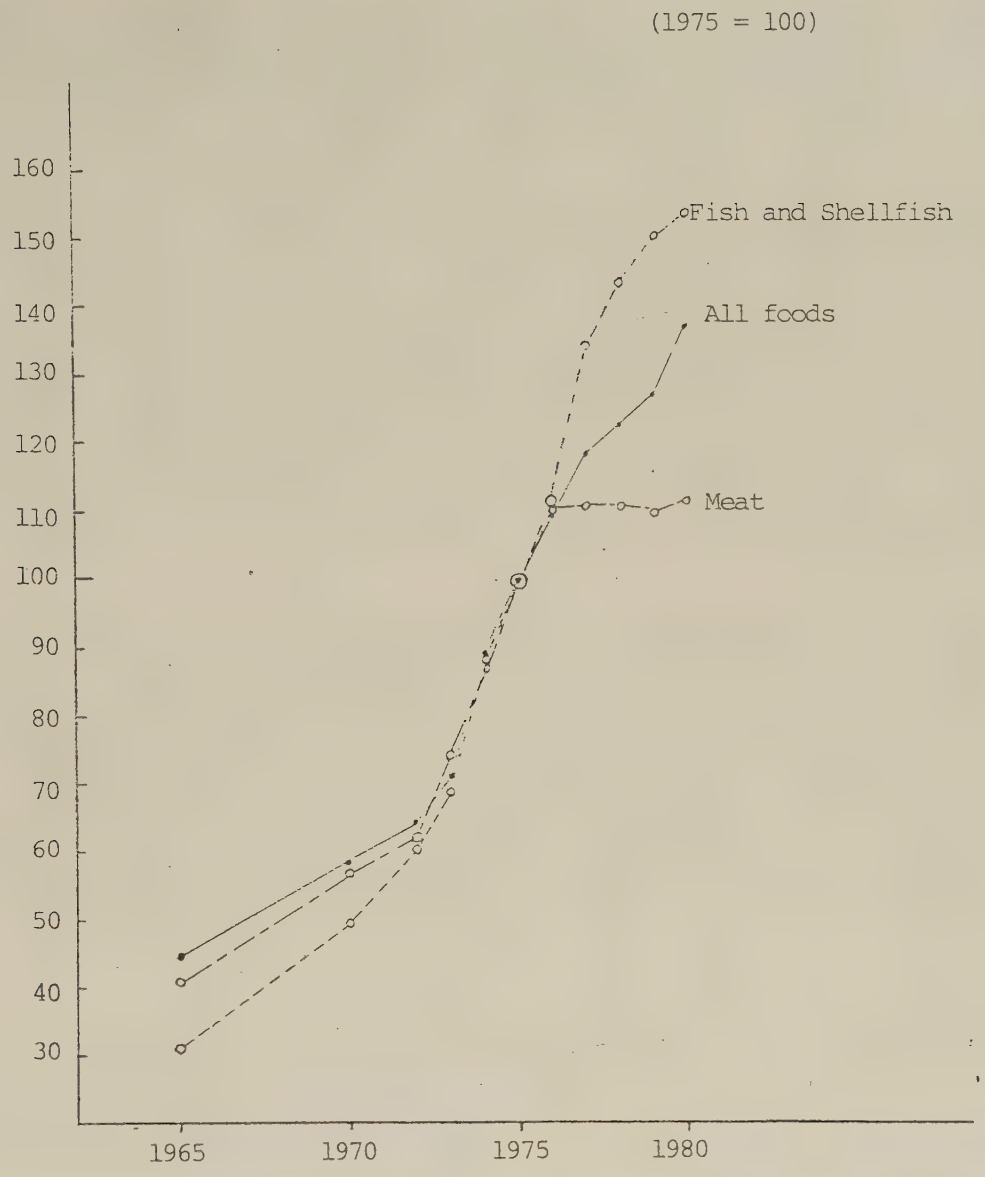
The second major change has been that of fishery consumption. Since 1965, prices of fish and shellfish have increased at a much faster rate than those of meat products. As a result, fish and shellfish products have become relatively more expensive, which has brought about a shift in consumption from fish to meat. This trend was intensified by the particularly sharp increase in fish prices during the latter part of the 1970's. However, thanks to an increase in income levels, the demand for fishery products remains high, with this demand centering on higher grade species.

The third principal change has been in fish utilization. With the advent of the 200 mile era, changes have occurred in species composition, which in turn have had an impact on catch utilization. For example, we have for many years depended on Alaska pollock as the raw material for kamaboko, a fish paste product, we consume in large quantities; but, with the sharp decline in the catch of this species since the start of the 200 mile era, production of fish paste has declined from 1 160 000 t in 1975 to 910 000 t in 1980.

The fourth change has been in the area of fishery operations. With the establishment of their 200 mile zones, many countries have imposed stringent fishing regulations operating in their waters. As a result of this pressure, the catch of our deep-sea fisheries has declined and we have been compelled to reduce our fishing fleets and discharge crew in a number of sectors, while profit margins have deteriorated. From the standpoint of continuing future operations, it has become necessary to restructure our fisheries.

1.3 Changes Resulting from the Sharp Rise in Fuel Price

Even apart from the problems caused by the 200 mile era, it may be noted that the price of fuel for fishing vessels has risen some seven times, owing to successive oil shocks in 1973 and 1980. This has particularly impacted on the earnings of such fisheries as trawl and squid jigging operating in offshore and deep-sea waters fisheries that consume large amounts of fuel. In response to this situation, we have developed a series of energy-conservation policies.



Trends in the consumer price index for foodstuffs

1.4 Counter-measures for the 200 Mile Era

To counter the problems, mentioned in 1.2 and 1.3 above, we have developed measures to effectively exploit underutilized offshore resources; to expand aquaculture to activate the productivity of the sea; and to develop new products that permit intensive catch utilization. At the same time, we have attempted to improve the efficiency of operations by employing low-energy vessels.

Based on the effective use of fishery resources that are not being utilized by developing countries, Japanese vessels have been able to continue their operations in the waters of such countries. We have also been contributing to the development of the fisheries of the various coastal states through a programme of technical and economic cooperation.

A full explaniton of the above will be given in the following Section.

2. ASSESSMENT OF PRESENT POLICIES, PRIORITIES, STRATEGIES. CONSISTENTS AND CONFLICTS AMONG OBJECTIVES, OPTIONS, CONSTRAINTS AND OBSTACLES TO ACHIEVE OBJECTIVES. MODALITIES ENCOUNTER TO SOLVE CONFLICTS, SUCH AS SMALL-SCALE AND INDUSTRIAL FISHING, ETC. CHANGES IN POLICIES STRATEGIES AND REASONS FOR SUCH CHANGES. IMPACT OF THE POLICIES ON:

2.1 Historical Development of Japanese Fisheries and the Establishment of Legislative Structure

2.1.1 The era of small-scale artisanal fisheries - through the feudal period

Japan is blessed with one of the world's most productive fishing grounds, thanks to a confluence of warm and cold currents off its coasts. Surrounded on all sides by the sea, and favoured by a highly indented coastline, our fishing grounds extend from the coast to offshore waters. As a result of this geographic environment as well as the prohibition on the consumption of meat from four-footed animals imparted by Buddhish philosophy, the Japanese people have, from time immemorial, been large eaters of fish, and this of course has helped to foster the development of a fishing industry from the earliest days of our nation.

The main fisheries that existed in Japan prior to the shift from a feudal to a western society in the mid-19th century were set-net, beach seine and other coastal-oriented fisheries using small-size non-powered vessels. By this period, coastal fisheries had substantially completed their development and were already fully utilizing the coastal resources. During the feudal era, management of fishing grounds was in the hands of feudal lords and was intended mainly as a source of tax levies. Fishermen were given rights to use certain waters exclusively on the condition that they pay taxes. Since these fishing grounds were clearly distinct from those of other fishermen, and since there was no expansion of fishing population or effort such as to generate ground conflicts, during the long feudal era (11th-19th century), with the exception of over-crowding in certain areas, no particular problems developed in connection with fishery management.

2.1.2 The development of large-scale commercial fisheries - 1900-40

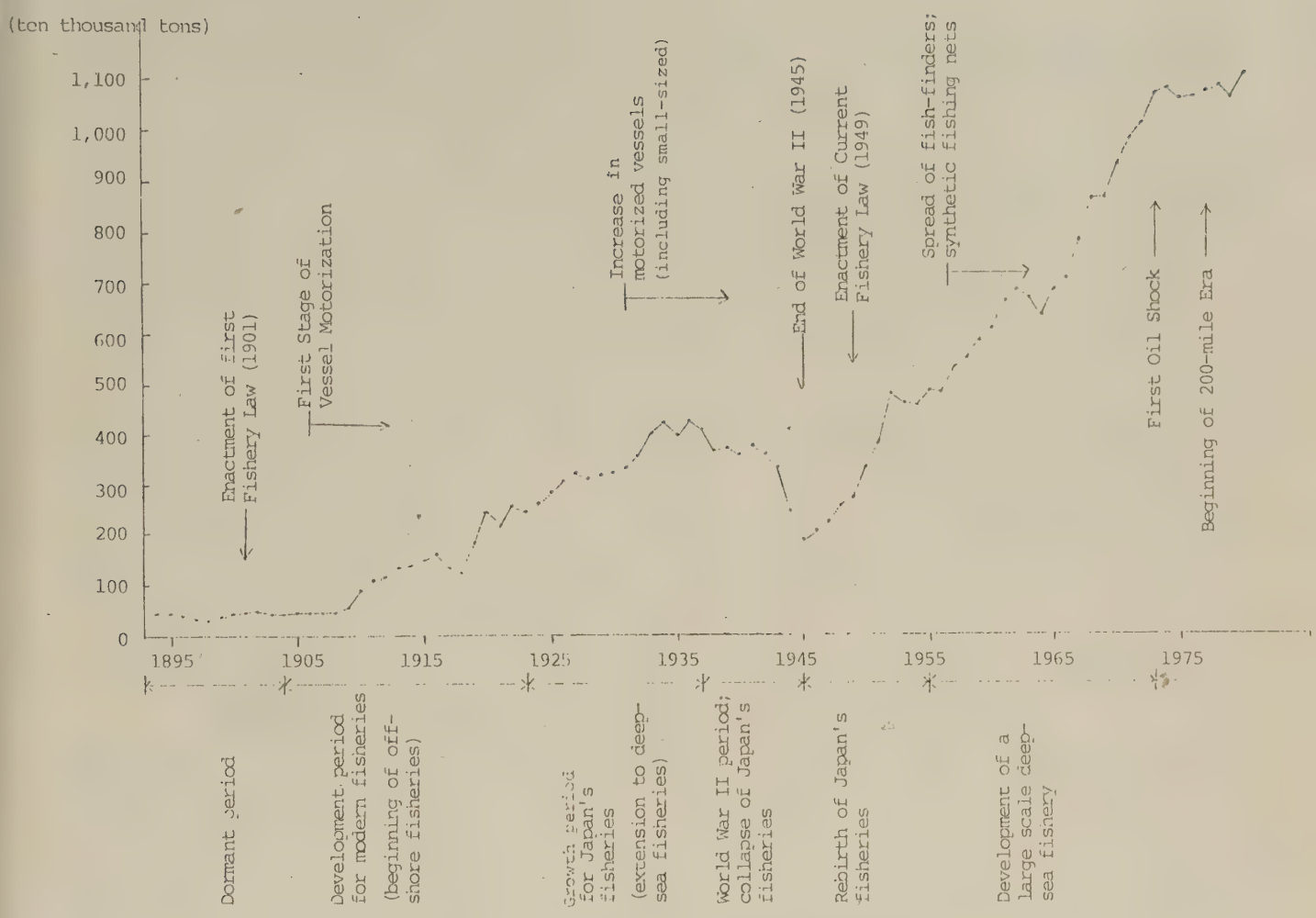
When Japan started to move away from feudalism toward a westernized society at the middle of the 19th century, our population was only about 20 million (vs. a present population of 120 million), of which an overwhelming proportion (16 million) were engaged in agriculture. At that time, the estimated fishing population was in the order of 1-1.5 million. The fisheries of the era included both food and reduction fisheries, with a total annual catch of only 400 000 t to 500 000 t, barely 4% of today's 11 million tons.

With the onset of westernization, the customs of the feudal era gradually gave way.

As a result, farmers who were previously restricted in their access to fishing started to enter the fishery, and other fishermen began to expand into new areas. Thus, fishing disputes gradually developed in many local villages.

In order to develop our fisheries while avoiding disputes among fishermen, our Government encouraged formation of fishermen's associations and, through these associations, implemented restrictions on fishing seasons, areas, and gears. But the areas of the grounds targeted for management were unchanged from the feudal era.

At the end of the 19th century, disputes began to arise among fishermen in various areas relating to an increase in the number and size of vessels and intensified competition in fishing grounds. In order to arbitrate these disputes and develop fisheries on a smooth basis, Japan's first Fisheries Law instituted at the beginning of the 20th Century. One objective of this Law was to reconcile, through stipulated enforcement procedures, existing customs with the changes in fisheries brought about by an increase in fishing vessels and intensified competion in fishing grounds. Another aim was to encourage financial aid to fishermen for vessel construction and other means of production and to broaden the range of operations into offshore waters for purposes of expanding fishery production.



Japan's fishery development and trends in fishery production
(production figures include aquaculture and inland waters fisheries)

2.1.3 The maturation of large-scale fisheries and the attendant increase in production - following world war II

Early in this century, sparked by the general economic progress, our fish catch broke the one million ton mark and, by 1935, had quickly risen to four million tons. Apart from the general economic development, another factor behind the rise in fishery production was the motorization of fishing vessels and the mechanization of gear and fishing equipment.

Motorized engines were imported from the West and, with their diffusion, it became practical to develop deep-sea fisheries, while the introduction of net and line haulers and other types of fishing gear, together with radio equipment, also enabled the fishing industry to grow in scale.

The motorization of fishing vessels played an important role in the development of Japan's fishing industry. It broadened the scale of the fishing enterprise, contributing to a shift from family-type operations to large-scale commercial management.

Still another factor in fishery development was the introduction of freezing and processing facilities, which enabled fish products to be transported and stored in large volume and over long periods. As examples, we may cite the introduction of refrigerated freight cars and trucks, large-capacity refrigerators, and the production of canned fish and fish paste products (such as kamaboko and fish meat sausages). The annual volume of fish now moving through our distribution system comes to 2 737 833 t, in ten large central wholesale markets, in 1979.

Trends in the number of powered vs. non-powered fishing vessels (including inland-water vessels)

Number of powered vessels by size class

Size Class	1948	1980
—— 10^{GT}	90,966 (86.2)	380,763 (94.9)%
10 —— 100	14,137 (13.4)	17,133 (4.3)
100 ——	479 (0.5)	3,454 (0.9)
Total	105,582 (100)	401,350 (100)

Fishing vessel motorization and the share of coastal fisheries in total fishery production

	Total No. of Vessels	No. of Powered Vessels	Share of Coastal Fisheries in Total Fishery Production
1905	423,000	11	96%
1930	359,000	31,000	70%
1980	429,000	401,000	20%

In addition to the effective utilization of catch on the basis of an expansion of production through the enlargement and motorization of fishing vessels and the development of storage and processing, there developed the science of aquaculture, which artificially activates the productivity of the sea itself.

Aquaculture was conducted in fish ponds and fishing pens and was geared to the raising of yellowtail, seabream, scallops and seaweed through the feeding of natural and artificial bait or the use of fertilizers to augment the ocean's natural productivity. More recently, in order to stimulate the use of the natural sea environment, we have started breeding seed fish in large volume for high-value species; after artificially raising the fish to a certain size, we release them to the sea in order to increase resource size. (Production of selected aquaculture species in 1980 shows yellowtail at 149 524 t; scallops at 40 400 t, and seaweed at 512 432 t.)

Japan's fisheries range from small-scale fisheries focusing on coastal waters to large-scale fisheries using modern fishing gear in distant grounds. Each sector has developed different types and scales of fisheries in terms of target species, fishing methods, and fishing areas.

Along with the development of the fishing industry, there has evolved an elaborate fishery management system. One aspect of this has been the introduction of a licence system covering the number and size of vessels, by fishery sector.

The object of the licence system is two-fold: first, to apply certain controls on production so as to conserve fishery resources; and secondly, to reconcile the interests of tiny coastal fisheries with those of efficient offshore fisheries.

To fulfill the latter objective, we have introduced a system of fishing rights, allowing fishermen the exclusive use of particular coastal areas as a mean of developing these fisheries through the effective use of coastal fishing grounds without provoking disputes between fishermen.

In 1949, at the beginning of the reconstruction phase of Japan's fisheries following World War II, a new Fishery Law was enacted. This Law was primarily intended to develop the productive capacity of and democratize the fishery industry.

3. WAYS TO ADAPT FISHERIES TO NEW SITUATIONS CREATED BY THE NEW LAW OF THE SEA, THE FUEL CRISIS, POPULATION GROWTH, ETC.

As explained in Section 1, with the establishment of 200 mile zones by many countries, we have adopted the following measures in order to achieve a stable supply of fishery products for our people and continue our traditional fishing operation within the 200 mile zones of other countries. We have also developed measures to cope with a sharp rise in fuel prices.

3.1 Development of Coastal Fisheries

With a view to actively utilizing the high ocean productivity with which Japan is endowed, we have adopted the concept of progressing from a "hunting fishery" to a "cultivating, and rearing, fishery". To this end, the Government of Japan has developed a policy of maintaining and managing fishery resources and fostering aquaculture, as follows:

(a) Development of coastal fishing grounds

This project has been implemented with a view to establishing large scale artificial fish reefs, large scale seaweed grounds for fish fries, building artificial beach for clams and shrimp and protecting fishing grounds from sewage and industrial pollution.

First plan - 1976-81 (6 years)

Expenditures: Yen 200 billion
(including subsidies)

Second plan - 1982-87 (6 years)

Expenditures : Yen 400 billion
(including subsidies)

(b) Improving the structure of coastal fisheries

This project has been implemented with a view to modernizing refrigeration facilities, fish markets, unloading equipment, fishing port facilities.

Period: 1979-85 (7 years)

Expenditures:	subsidies:	Yen 200 billion
	Financing:	312 billion
	Total	Yen 512 billion

(c) Development of technology for propagative fisheries

In cooperation with various prefectures, propagative fishery centers have been established to develop fry production techniques and carry out fry production programmes. There are now 45 such centers throughout Japan. The budget for this programme in recent years has been as follows:

	(in Yen billions)
1977	1.6
1978	2.5
1979	4.2
1980	4.8
1981	4.5
1982	3.9
Total	21.5

As a result of the policies carried out under 3.1.1 to 3.1.3, fishermen's incomes have improved and fishing grounds of high productivity have been improved and maintained. This has contributed to an expansion in the catch of high-grade fish and shellfish species in strong demand.

3.2 Expanding the Consumption of Species Caught in Large Volume

In order to expand the consumption as food of such high-volume species as sardines and mackerels which are caught in the waters around Japan:

(a) we have used TV, published pamphlets, developed recipes and conducted cooking classes to acquaint the consumer with these species and popularize them throughtout the country

(b) with a view to promoting the consumption of such species, we have conducted research and development to insure that the expanded consumption will meet changes in consumer requirements. As a result, we developed sardine and mackerel fish paste products, and have conducted research on the utilization of fish protein as marine beef and as an ingredient for fish hamburgers;

(c) in addition, starting in 1982, as a pilot project for maintaining freshness in the distribution of fish products, we have invested some Yen 120 million in the development and implementation of a distribution system incorporating the use of freshness labels on fishery products to permit strict quality control in this area.

As shown below, these programmes have been quite effective. As a result, consumption of sardines, which had previously gone mainly to non-food uses, expanded as follows:

Edible Consumption of Sardines (in 1 000 t, round weight)

1975	1978	1980
420	600	760

3.3 Maintaining Operations in the 200-Mile Zones of Foreign Countries

Since the advent of the 200 mile era, in order to be able to utilize the surplus resources off coastal states whose waters incorporate our traditional fishing grounds, we have managed to sustain operations throught the conclusion of Fishery Agreements with these coastal states. Agreements are now in force with 16 coastal states, from whom we are receiving a total catch allocation of some two million tons per year.

In connection with this fishing activity, we are paying fishing fees to coastal states and are extending cooperation in developing their fisheries. In this way, our fishing vessels have been able to sustain operations, while the fisheries of coastal states have also developed. Through this cooperation, we have given meaning to the precepts of the Law of the Sea with respect to allowing foreign countries to catch the surplus resources of coastal states and holding to a minimum economic disruptions to the former.

We may cite the following projects as examples of overseas fishery cooperation:

(a) on the Governmental level:

(i) grants-in-aid for research activities, training vessels, and shore-based facilities to developing countries; and

(ii) receiving of trainees, dispatch of experts, and technical cooperation in research and development.

Goverment Level Aid	(In Yen billions)
1977	3.0
1978	5.0
1979	6.0
1980	6.6
1981	7.1
1982	7.5
Total	35.2

(b) on a private level. The Overseas Fishery Cooperation Foundation has:

(i) lent working capital to Japanese fishermen for implementation of overseas fishery cooperation programmes; and

(ii) accepted trainees and dispatched experts.

Private-Level Aid	(In Yen billions)
1977	5.5
1978	4.8
1979	4.3
1980	4.2
1981	4.2
1982	4.5
Total	27.5

With the development of fisheries in countries with 200 mile zones, our overseas fishing grounds and catch allocations have been declining year by year. The catch of our deep-sea fisheries has declined from 3 988 000 t in 1973 to 2 160 000 t in 1981, though in the past 2-3 years catch allocations have begun to stabilize. At the same time the economic situation of our fishing vessels has worsened as a result of various demands from coastal states for time and area closures, limits on the number of fishing vessels, fishing fees, fishery cooperation, etc.

3.4 Vessel Reduction Programme

In an effort to respond to the loss of fishing grounds and reductions in catch allocations to our vessels in relation to the establishment of 200 mile zones by foreign countries and in order to maintain a stable and viable fishery management, we have been compelled to limit vessel deployment to a level consistent with the fish allocation that can be caught in a particular area. Since 1976, we have withdrawn from service a total of more than 1 600 vessels, as a result of which some 13 000 fishermen have had to be discharged. Furthermore, with the attendant scaling down and bankruptcies in related industries, there has been incalculable socio-economic damage to regional communities.

To cover temporary welfare payments to fishermen who have lost their jobs and to keep the remaining fishermen to continue fishing, a sum of over Yen 150 billion has been spent by the Government and governmental financial agencies to facilitate this vessel reduction programme and to finance continuing operations by the remaining vessels.

We have adopted a system under which fishermen continuing to fish pay compensation to cover a portion of the living expenses of those who have lost their jobs (a mutual assistance programme). This is intended to avoid a breakdown in the basic living standards of discharged fishermen.

On the basis of the above, we have been pursuing a reorganization programme centering on vessel reduction. However, the management crisis caused by the gradual loss of fishing grounds within the 200 mile zones of foreign countries continues to plague our industry.

3.5 Energy Saving in Fisheries

Since 1980, we have taken the following measures:

(a) A reduction of 10% main engine speed

On this basis, despite a slight increase in cruising time, a 6% saving on fuel costs has been achieved.

(b) Introduction, dissemination, and promotion fo energy-saving designs for fishing vessels

Based on financial and tax incentives, we have sought to improve propulsion efficiency by encouraging energy-efficient vessel designs (e.g., engines with low fuel consumption, hulls with low water resistance, improvement in screws and fishing vessels with reduced weight).

In this way we were able to cut fuel consumption by some 20-30%.

(c) Joint operations

We have further reduced operating costs by pooling the operation of carrier vessels and by encouraging joint operations among catcher boats engaged in the same fishery.

The above summarizes the kind of measures that have been taken by Japan since the advent of the 200 mile era and the sharp rise of fuel prices. However, the economic situation of our fishing vessels is generally still not out of the danger zone. Thus, these efforts must be continued to the future.

4. EXPERIENCES IN THE COUNTRY THAT COULD BE CONSIDERED AS A FIRST STEP TOWARDS NEW STRATEGIES FOR FISHERIES DEVELOPMENT

There are certain problem areas which we have become aware of in connection with the fisheries policies of coastal states, through Japan's experience in fishery cooperation programmes.

Coastal states which, for reasons of custom, lack of production facilities, or an inadequate distribution system, have not yet become accustomed to eating fish, are building into their fishery development programmes the use of fishery resources from their 200 mile zones as a means solving food shortages and boosting employment and incomes.

However, fish being highly perishable, it is necessary to maintain fish products in a fresh state. It is also vital to deliver products appealing to consumer taste. To accomplish this, the following are required: (i) promotion of fish consumption through educational programmes; (ii) the development of processed fish products such as sausages to make fish items more acceptable to their people; and (iii) the improvement of distribution facilities for fishery products, such as refrigeration equipment.

It is pointless to seek foreign aid in the building up of a country's fishing fleet without simultaneously taking action on the consumption front.

There are certain coastal states that, since the enactment of their 200 mile zones, have sought to exclude fishing vessels of foreign countries with traditional fishing activities in their waters and permit operations only on the basis of joint ventures. Joint ventures are intended to complement the deficiencies of countries with capital and technology and of countries with abundant resources and/or favourable locations.

There are differences from country to country in the desirable mix of conditions for operating joint ventures. There are also differences in the stage of economic development among countries planning joint venture. If these differences are ignored and a flat ratio is established for local capital or local crew, this can prevent the success of the joint venture. Thus a flexible approach is called for.

Japan's fisheries have managed to develop on the basis of balanced policies keyed to overall economic development in the areas of production, processing, distribution, and marketing.

As explained above, there is a tendency among developing coastal states to undertake too rapid a development of their fisheries and prematurely introduce advanced technology and large scale fishing operations that fail to match their location or the development stages of their fisheries.

In light of our own experience, fishery development should take place on an orderly, step by step basis.

5. OPTIONS FOR FISHERIES DEVELOPMENT

Among the basic factors making possible the development of Japan's fisheries were the following: (i) the fact that Japan is a maritime country surrounded entirely by the sea, with abundant usable fish resources in its coastal waters; (ii) the fact that for a long time, consumption of animal products was prohibited for religious reason thereby discouraging the development of a livestock industry and fostering a high degree of dependance on fish and shellfish as a source of animal protein.

We have already explained the historical stages of development of Japan's fisheries in Section 2.

The development of Japan's fishing industry to today's mammoth scale has been due to an accumulation of knowledge and experience, through its long history, in the areas of fishing grounds, fishing seasons, fishing methods, and processing and utilization, and the adoption of fishery legislation and policies geared to the requirements of each particular era. Fishery development has responded to the socio-economic conditions of the various periods and has taken a form compatible with domestic needs.

Generally speaking the following considerations should be taken into account in developing a fishery development strategy:

(i) Responding to the demand for animal protein

(a) rate of population growth
(b) national income (purchasing power)
(c) supply capability for livestock products
(d) consumer tastes

(ii) Providing employment opportunities

(a) sound development of fishing villages
(b) distribution of the labour force by industry

(iii) Infrastructure development

(a) ports, fish markets, refrigeration facilities
(b) roads, transport modes
(c) electric power, water, gas

In order to develop from small-scale coastal fisheries to commercial-scale fisheries seeking an economic return, the following areas should be considered in addition to those shown above:

- Research (evaluation of resource size; development of new fishing grounds).
- Technological development (motorization and enlargement of fishing vessels, improvement of gear and fishing methods, processing and preparation of catch).
- Expansion of the scale of the management unit
- System for financing fisheries.
- Market development (securing foreign exchange).

As explained in Section 2, Japan has implemented policies geared to fishery development to meet the needs of each era. These policies have been along the following lines:

- during the feudal era, we adopted policies which placed a priority on increasing employment opportunities in fishing communities and supplying fishery products as a source of animal protein;
- starting in the mid-19th century, with the development of Japan's economy, we adopted policies encouraging the development of large-scale commercial fisheries;
- at present, we are adopting policies geared to the rationalization of fishery management under the new 200-mile regime in a period of rapidly escalating fuel prices.

6. HOW A NEW STRATEGY WOULD FIT IN THE OVERALL NATIONAL DEVELOPMENT PLAN

In Japan, as elsewhere, fishery development plans are incorporated in national development planning, but, in comparison with other industries, the fishing industry's weight is small (only 0.7% of GNP, 0.8% of total employment). Thus, in comparison with developing countries, where the fishing industry is relatively more important, Japan can be said to have considerably more freedom in selecting policies for fishery development.

The twin objectives of Japan's fishery policy have been:

(a) to provide a stable supply of fishery products as a source of animal protein for our people; and

(b) to raise fishermen's incomes and sustain and develop a vigorous fishing industry.

The former objective has been particularly important, when one considers the small land base avaible in Japan for developing a livestock industry.

Until recently, the above policies could be smoothly implemented, thanks to the following conditions:

- the principle of freedom of the seas - of vital significance to a country like Japan, whose fishing industry must have access to the offshore and deep sea fishing grounds of other countries for its development;

- the accumulation of technology and knowledge (as far back as 1936, Japan's catch was already at the level of 4 330 000 t);

- the fact that Japan is blessed with a superior and abundant supply of fishermen;

- our ability to secure relatively cheap fuel; and

- technological innovation at both the production and consuming levels.

However, as a result of a spectacular seven-fold increase in fuel prices in the wake of two sudden hikes in oil prices, the economic situation of fishing vessels has come under considerable pressure. In addition, since the establishment of 200 mile zones starting in the mid 1970's, it has become difficult for us to retain our traditional fishing grounds in the fishery zones of other countries. We have thus been compelled to carry out a reorganization of our fishing industry, including a reduction in deep-sea fishing activity. (The catch of our deep-sea fisheries fell from 3 999 000 t in 1973 to 2 160 000 in 1981.)

We regard to the policies our Government has taken, regarding the fuel crisis and the establishment of 200 mile zones, this has already been discussed in Section 4 and so can be skipped over here.

Recent effects arising from the above are as follows:

(a) Operating difficulties of deep-sea fisheries

In order to compensate for a reduction in allocations to Japan within the 200 mile zones of other countries and maintain a stable and rationalized structure within our fishing industry, we have reorganized our production structure with primary emphasis on a reduction in the number of vessels. We have also initiated a series of measures to promote energy conservation. However, as a result of increased demands for fishery cooperation and ever higher fishing fees as conditions of fishing within the 200 mile zone of other nations, the economic situation of our fishing vessels continues to be difficult. (Total fishing fees came to almost Yen 9.8 billion in 1981.)

(b) Development of fishing grounds around Japan

We have for many years been developing our fishery propagation and increasing productivity in our coastal fishing grounds. Since the advent of the 200 mile era, we have further strengthened these efforts. As a result, there has been an increase in the catches of species for which consumer demand is strong with a parallel increase in the incomes of coastal fishermen. (The catch of our coastal and offshore fisheries rose from 787 000 t in 1977 to 894 000 t in 1981.)

(c) Species diversification

Since the advent of the 200 mile era there has been a decline in the catch of fish such as Alaska pollock, for use as raw material in processed paste products, for which we had depended on foreign waters. As a result of developing technology for new processed products, there has been an increase in the proportion of human consumption in species such as sardines and mackerel, which can be taken in large volume in Japanese waters.

(d) Increase of imports of fishery products

Japan's imports of fishery products have shown a rapid upturn since the early 1970's and, since the advent of the 200 mile era, there has been a continuous expansion

in the imports of species for which there is a strong demand in Japan, such as shrimp, squid, tunas, octopus, salmon, and crab. (Japan's total fishery imports rose from 815 000 t, valuated Yen 563.6 billion, in 1976 to 1 129 000 t, valuated Yen 879.9 billion, in 1981.)

(e) Trends in Fishery Demand and Fish Prices

Following the advent of the 200 mile era, domestic fishery prices in Japan rose sharply, which led to a temporarily falling off of demand for fishery products. For, when fish prices rise too high, demand shifts from fish to meat and dairy products. If this trend continues for a long time, there arises the phenomenon of the consumer turning away from fish. Thus, there are obviously limits to the extent to which fishery producers can pass on increased production costs to the consumer.

Our fisheries have, accordingly, fallen on hard times as a consequence of the rise in operating costs and the stagnation of earnings as a result of fish prices reaching a ceiling.

7. ROLE TO BE PLAYED IN A NEW STRATEGY BY THE DOMESTIC, SMALL-SCALE FISHERIES; ITS RELATIONSHIP WITH RURAL DEVELOPMENT PLANS

Some 360 000 fishermen are engaged in our coastal fisheries, providing an annual catch of 3 005 000 t. These coastal fisheries as well as conditions in fishing villages tend to be affected by: (a) geographical factors; (b) the types and abundance of fishery resources in coastal waters; and (c) the existence of other industries in surrounding areas. These communities may be broadly classified into those entirely dependent on fishing; those that are both fishing and agricultural in nature; and those that fish only on a seasonal basis.

As discussed in Section 2, until the expansion of its secondary industries such as steel and automobile, Japan was heavily dependent on the agricultural and fishery industry , with coastal fisheries playing a major role in regional economic activity. As the coastal fisheries expanded, with the development of knowledge and the acquisition of experience, it became possible, on the basis of suitable Government policies, to move from small-scale to medium-scale and then large-scale fishery operations. This trend carried over into the development of large-scale processing as well as the ship-building industry.

On the other hand, when economic development moved into high gear, accompanied by technological innovation, various sectors began to make demands on coastal waters - e.g., for industrial reclamation for use in steel production or petroleum refining; drainage from thermal power stations, food and chemical plants; and the mining of sea-bed resources. This created an important problem as to how to coordinate these demands with the requirements of the fishing industry. In regional economic development plans, different ways might be adopted to deal with the placement of fisheries. From the standpoint of fishery development, it is necessary to adopt policies for determining land and water allocations among various industries based on long term area development plans.

Of course, the degree of economic development and local conditions will vary from country to country, so that it is not appropriate to force a uniform fishery development model on each target nation.

8. TYPE OF APPROPRIATE TECHNICAL COOPERATION REQUIRED FOR NEW STRATEGIES; IN PARTICULAR, IN THE FRAMEWORK OF TCDC

As explained in Section 4, fishery development in developing countries must take into account the economic environment affecting the particular country and be based on steady, balanced policies. In this sense, one very useful technique is for developing countries with similar economic environments in contiguous areas to develop good communication with regard to fishery policies and implementing conditions, with a view to introducing technology in fields appropriate to each country. For example, developing countries can hold seminars on fishery development and develop training programmes for particular fisheries, securing the cooperation of experienced fishing nations through the FAO and other international bodies.

9. POTENTIAL FOR A REGIONAL STRATEGY AND ROLE THE COUNTRY MIGHT PLAY IN IT

Under the 200 mile era, each coastal state has primary responsability for the conservation and effective utilization of fishery resources within its waters.

Thus, it is first necessary to conduct a resource evaluation of indivitual stocks within the country's fishery zone, and when it is not possible for the coastal state to undertake such studies on its own, it would be appropriate to seek the assistance of other fishing nations. When there is an international fishery organization, it is fitting that the studies be made cooperatively by member nations. A determination of total allowable catch should be made based on scientific evidence; and surplus that cannot be caught by a country's own fisheries should be allocated to other fishing nations. In this manner, the resources can be efficiently utilized, and this will help to secure food supplies for the people of the world.

At the same time, coastal states can receive economic and technical cooperation from advanced fishing nations for development of their own fisheries. It is desirable that fishery resources be efficiently used to the mutual benefit of both coastal and fishing nations.

When a coastal state formulates and implements strategy to develop its fishing industry, the FAO, UNDP, the World Bank and other international agencies can play an important role in the development and implementation of this strategy. But, in such instances, standardized approaches should not be forced on the development strategy. Fine-tuned plans should be developed which meet the special characteristics of each country.

Particularly in the case of fishery development in developing nations, there is a tendency to prematurely introduce hig-level technology and large-scale fishery operations, and many such cases end in failure. It is vital therefore, to adopt a staged, steady fishery development programme keyed to the nations's physique, nutritional levels, consumer tastes, and dietary patterns as well as the degree of development of distribution channels, processing facilities, and other socio-economic infrastructure.

In this sense, we feel that it is effective to cooperate technically, by exchanging information on successful examples of fisheries development among fishing countries and build these findings into their own policies.

FISHERY POLICY IN NORWAY - EXPERIENCES FROM THE PERIOD 1920-82 CASE STUDY

by

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ABSTRACT

The purpose of this paper is to describe and evaluate the most important measures taken by the Norwegian Government during this century concerning the fishing industry.

Norway is one of the big fish producers in the world (number six in catch volume 1979). In the context of the national economy as a whole, however, the fishing industry today is of minor importance, though regionally it is still of considerable importance. A characteristic feature of the Norwegian fishing industry is the large number of relatively small economic units and a fishing population scattered along the coast.

Norwegian catch was multiplied by five from 1910 to 1982. On the other hand, the number of fishermen today is only a fifth of what it was in 1938. Average catch per man-year has thus shown a remarkable increase. A phase of expansion in relation to catch volume and catch capacity lasted till about 1970-75. Thereafter the emphasis in fishery policy had to be switched from 'how to increase catch and efficiency' to 'how to stop overfishing and the growth in catch capacity'.

The paper deals in detail with different measures taken during the phase of expansion. After the great depression in the 1930's and up to 1970-75, the coastal population, heavily dependent on the fisheries, experienced considerable economic progress, despite resistance from the industry to the use of large trawlers and increased capitalization. Up to 1960 such progress was achieved without income subsidies and resulted from improved technology in fishing and processing and general regional programmes providing better communications, etc. During the last decade of the expansion period it became clear that the international fishing fleet in the Northeast Atlantic was able to overexploit the stocks.

The paper then proceeds to elaborate on the measures taken during the phase of contraction (after about 1970). There has been a further

increase in the standard of living in coastal areas even during the last decade. Increased income subsidies and a more comprehensive regional policy were important factors behind this development. Over-capacity made the full-year utilization of a technically sophisticated fishing fleet almost impossible and created considerable deficits on the average. A scrapping programme made the economic situation far more healthy. Owing to the influence of national and international determinants, external to the fisheries, the outlook for the Norwegian fishing industry is far from cheerful.

In conclusion the paper summarizes some of the most important lessons to be learnt from the Norwegian experiences.

1. THE NORWEGIAN FISHING INDUSTRY - DEVELOPMENT AND PRESENT SITUATION.

Together with Peru, USA, Chile, and South Korea, Norway is a member of the "upper middle class" in the world of fisheries, with respect to catch level, behind the two leading nations, Japan and the USSR (and China, if we include freshwater fishing). In 1981 the Norwegian catch amounted to 2.7 million tons, or four percent of the total world catch.

At the national level, the importance of the fishing industry in Norway at present is minor. It engages only two percent of the labour force and contributes only one percent to the net national income. However, located along the coast, the fishing industry still is very important regionally, particularly if we include the diversified activities deriving from the fishing industry. Once fisherman thus creates four to six other job opportunities.

Norwegian landings of fish consist of a great variety of species. The most important fisheries are the capelin and the cod fisheries. Both are concentrated in North Norway. Most of the capelin catches are used for reduction to fish meal and oil. The capelin fleet consists of about 200 relatively large purse seiners with a cargo capacity of from 300 to 2 000 tons. The landings of cod and codlike species like haddock, saithe, ling, etc., are processed into salted, dried, or frozen fish. The cod fisheries are the most important both with respect to the value of the catch, and the employment that it generates. In the cod fisheries we see a characteristic feature of the Norwegian fishing industry: a large number of comparatively small economic units, both regarding vessels and processing plants, a fishing population scattered along the coast in numerous fishing villages, where the fishermen themselves are usually the owners of both the fishing boats and fishing gear.

Domestic consumption in Norway accounts for only ten percent of the catch. Consequently the Norwegian fishing industry is heavily dependent on the international market situation for fish and fish products.

The full-time employed fisherman's average income is on the same level as the average wage of the industrial worker. However, the fisherman's income level is partly attained through state subsidies.

The Norwegian fishing industry went through a phase of expansion until about 1970-75. Thereafter, contraction was characteristic of the development, both regarding catch and capacity. For catch volume, this is indicated by Figure 1. The catch in 1981 was more than five times as large as in 1910, and about 2.5 times the catch in 1939. So far, the greatest annual quantity was reached about the mid-seventies. Another feature worth recognizing, is the sharp decline in catch that occurred towards the end of the fifties, due to a severe overfishing of the important Atlanto-Scandian herring stock in the years before. The decline in catch about 1966 resulted from previous overfishing of the North Sea mackerel stock. The decline in the mid-seventies is explained by the attempt of the Norwegian authorities, together with the Soviet Union, to avoid overfishing of the capelin stock in the Barents Sea.

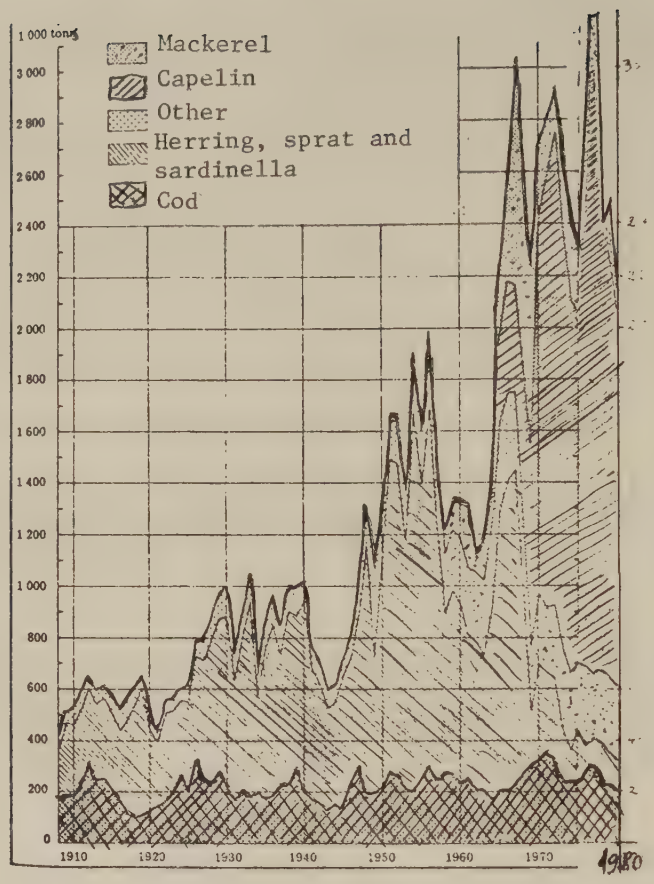

Figure 1 Landings of fish in Norway vessels in 1908-81

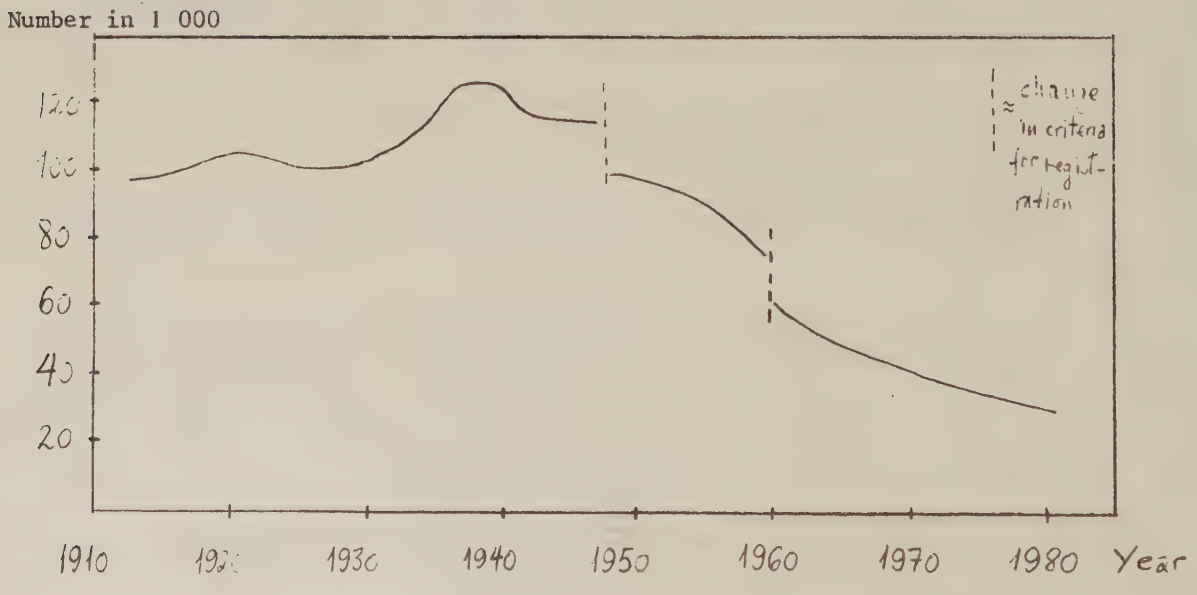

Figure 2 Number of fishermen

The Norwegian catch of cod and codlike species has increased slightly since 1910, despite the steadily growing fishing effort. This is partly due to international overfishing of the cod stock in the Barents Sea prior to the establishment of the Norwegian 200 mile zone from 1 January 1977.

The number of fishermen increased from the beginning of this century up to 1940. A remarkable increase took place in the 1930's. Most probably this was, to a certain degree at least, a consequence of the extraordinarily high unemployment rate in these years. Many a family was able to find a small income by self-employment in a free access fishery. After World War II the participation in the fisheries went steadily down, as the Norwegian society became more industrialized and settlement more centralized.

Comparing Figures 1 and 2, it is evident that the average catch per fishermen has shown a remarkable increase. Most of this increase is, however, due to the development of the highly efficient purse seiner fleet and the connected exploitation of "new" resources such as capelin, blue whiting, etc. Also in the cod fisheries there has been a considerable increase in efficiency per man-year. One should, however, be aware of the fact that the amount of factors of production involved, such as gear, fuel, and capital has increased substantially, and to a great extent replaced manpower. Consequently, the economic efficiency has not been raised as much as the increase in catch per fisherman would seem to indicate.

When discussing the Norwegian experiences, perhaps the most relevant subject for FAO should be the phase of expansion. But to avoid overexploitation, overcapacity and severe economic and regional problems, the Norwegian experience from the last ten years should also be studied carefully.

I have, in accordance with the two phases mentioned, divided the discussion of policy into the 1920-70 and the 1970-82 periods.

2. MEASURES TAKEN BEFORE 1970

The measures which here will be described, were not the result of a coherent development plan, but resulted, at least to a certain extent, from political pressure from the fishermen and their organisations.

At the beginning of this century the fishing industry was one of the most important sectors, and the largest export business in the Norwegian economy, accounting for approximately 30 per cent of Norway's total export. Compared with present-day technology, both the methods of fishing and fish processing were primitive. Compared with the average efficiency in business at that time, however, fishing and fish processing could provide the fisherman and his family with a reasonably good standard of living. Even so, there were variations along the coast. The herring fisheries in South and Mid-Norway had been prosperous for several decades, whereas the fishermen in the north, mainly with the cod fisheries as a means of livelihood, had experienced a lower average standard of living over a long period. It may be said that the northern region was underdeveloped, even when measured against the average standard of that time.

The fact that the fisheries heavily dominated the economic activities in the north, apparently made the Government draw the conclusion that in order to industrialize the region - which was considered necessary to improve the general standard of living - one should at least industrialize the fisheries. Since then, Norwegian fishery policy has to a great extent been part of a regional policy aimed at industrializing the northern part of the country.

2.1 The Raw Fish Act. Fishermen's Sales Organizations

During the early part of this century individual firms found their own export markets. These exporters bought fish on credit from the fishermen and paid them after the export sale was completed. As long as the fish export trade was good and fishermen were not sufficiently organized to demand a different system, this was tolerated.

The beginning of cooperation among fishermen coincided with a crisis in the fish export market (1917 and the following years). Low prices meant very low prices to the fishermen.

In 1927, the herring fishermen in West Norway met and formed "The Large Herring Sales Organization". They agreed that buyers were to pay a minimum price for fish and that payment had to be either in cash or in bank guarantee. When the first herring catches were landed in January 1928, not one fisherman sold under the price set by the fishermen's price-setting committee. Later on, several other sales organizations emerged. They requested the Government to protect their negotiations and their systems of price setting by law. In 1929, the Government enacted the following statute:

> "It is forbidden to export fresh herring ... unless the herring is bought for this purpose from a fishery organization whose bylaws are recognized by the Ministry of Commerce ..."

One by one different groups of fishermen went to the Government to obtain ratification of sales organizations similar to that granted to the herring fishermen. Later on, the time was ripe for a general legislation to recognize the separate sales organizations which had already been established, as well as to provide mechanisms for future organizations to be recognized. Such legislation, labelled "The Raw Fish Act", was introduced in 1938. Meanwhile, the fishermen had sought a broadening of the function of the sales organizations. This was included in the Raw Fish Act, of which the main regulations are:

- The Government may prohibit preparation, processing, sale and export of fish or fish products unless the fish initially was bought with the approval of a fishermen's sales organization approved by the Government;

- Approved sales organizations may insist that buyers first obtain a buyers' licence from the organization;

- When market conditions so require, an approved sales organization may place a temporary ban on harvesting or demand restrictions on fishing;

- Sales organizations can set minimum prices which buyers must pay, and have the authority to change these prices.

The sales organizations had developed both to ensure that fishermen got payment and that they shared the profits earned from the whole fishing industry.

Even with the Raw Fish Act, however, there was no point in setting fish prices considerably higher than the buyers could afford to pay. Thus the Act did not automatically result in significantly higher incomes for the fishermen. Their incomes continued to depend on the market situation. But the psychological impact of the change in power from the processing and selling of a product to the harvesting, was immense. It also stabilized the day-to-day and week-to-week fluctuations of the fish prices, and it guaranteed the fisherman immediate payment for his landings.

2.2 The State Fishery Bank/Grants for Building Coastal Vessels

The State Fishery Bank was established in 1921, with the purpose of contributing to the development of the fisheries by granting sufficient investment credit. Some of the money came straight from the Treasury, the rest was raised by issuing bonds. Credit could be given to projects that were expected to give the owner a sufficient surplus; i.e., the State Bank was to follow normal banking procedures. Because of the rather bad economic situation in the fisheries from the end of the 1920's the impact of the bank was thus inevitably marginal. The Government therefore granted a capital subsidy for new fishing vessels, allowing for up to 40 percent of total cost of the vessel to be covered. This helped to secure economic viability for projects previously unprofitable.

Grants could be given to partnerships (cooperatives) of fishermen. All of them had to have fishing as their main source of livelihood. The vessels were required to be of best quality and have modern equipment. The Government should have mortgage in the vessels.

Almost four hundred 'State vessels' were constructed in the years 1935-39. They were owned by 1 050 fishermen. These vessels constituted 61 percent of the newly constructed vessels in the size bracket 60-70 feet during this period and 32 percent of the new

vessels in the size bracket 50-55 feet. These vessels were exceptionally well built and some of them are still fishing. They meant a leap forward with respect to technology and efficiency in the coastal fishery. The experiences with new gear, electronic fish finding equipment and better constructing solutions spread to other fishermen.

After World War II the capital subsidy arrangement was not reimposed. In spite of this the State Fishery Bank has, up to now, been the main supplier of investment capital.

2.3 Fishing vessels must be owned by fishermen with fishing as their main source of living

The owner of a relatively large vessel could already in the 1920's make quite a lot of money in the abundant herring fisheries. This gave the 'capitalists' a motive for going into this fishery, with large and efficient vessels. Fishermen operating from smaller vessels took this as a threat, mainly of overproduction and lower prices, but also because of the general aversion towards foreign capital in this business.

The Norwegian Fishermen's Association (founded in 1920) claimed that the right to own fishing vessels should be limited to fishermen who for at least three years had been active in fishing. Foreign capital was not to be admitted to the fishery.

The Government accepted these claims, and a general licensing scheme was introduced in 1950, permitting only persons having at least three years of practice and who were still still in, or naturally connected with the fisheries to own a fishing boat. The implementation of the law was liberalized around 1960, permitting fishing plants in some cases to own deep sea trawlers.

2.4 Resistance towards trawlers in the cod fisheries

In 1930, Norway had only one trawler. But trawling was developing in other countries like Germany, Great Britain and Iceland, and the new kind of gear resulted in increased catch. Not surprisingly, the interest in the new gear spread to Norway and caused the construction of seven new and relatively large vessels intended for trawling. The small-scale fishermen were worried over this development, fearing overproduction, especially of fresh fish for the home market. In addition, the opposition against trawlers argued that the trawlers would exterminate the cod brood, overexploit the stocks, and, not least, result in capitalists taking over in the fisheries.

In 1936, the Storting passed a new law, which banned trawling within Norwegian sea territory, and also prohibited landing of fish caught with trawl outside this territory. Norwegian trawlers already purchased could be exempted.

In the 1960's, the policy regarding trawlers was liberalized, and several stern trawlers ('fresh fish trawlers') were purchased and put to fishing in the Barents Sea, in order to provide the frozen fish plants with more stable deliveries of raw fish. The majority of the fishermen were still against the tawlers, but were no longer able to resist the growing power of the industrial workers of the fishing plants, who argued that the delivery of raw materials from the trawlers could give them more secure jobs than the coastal fleet.

2.5 Stimulating the build-up of a frozen fish industry

Before 1940, the catch in the cod fisheries was used for fresh consumption, salting or drying (stockfish). After World War II, the central authorities stressed the need for a substantial increase in the production of frozen fish, based on the assumption that the use of frozen, prepared food would become more and more common. A large number of freezing plants along the coast would also contribute to the industrialization of the sparsely populated regions, and create a drive for more centralized settlement, better suited for modern and efficient production and leisure time activities.

By combining different instruments, the fishery authorities stimulated the construction of a modern frozen fish industry in the years after 1946. Today there are about

two hundred freezing plants in Norway, of which the majority is localized in the northern region.

The processing of frozen fillets created a great number of new and in many ways far better job opportunities. But the new plants were expensive. Depreciation and interest had to be paid, something which required full utilization of the invested capital. This gave birth to a considerable demand for more fish to the frozen fish plants. And the supplies had to be much more stable than those which the inshore fleet could guarantee. Plant owners, the work force on these plants, together with the municipal politicians fighting for more jobs for their small towns, all argued for a more liberal practice regarding the licensing scheme for trawlers. The Government, who had a positive attitude towards advanced technology in the fisheries, gladly gave in to the pressure and issued about 80 licences for deep sea-trawlers during the period 1965-75.

2.6 The Main Agreement - State Subsidies

Shortly after World War II, the Norwegian Government, in order to stabilize the economy and offset inflation, introduced a general price and wage control. At the same time, the world market for fish was favourable. This made it possible for the Government to set aside a large part of the profit of the fish exporters in a Reserve Fund. The Fund steadily increased in value up to 1953. By that time, the wage and price control had been liberalized, and the sales organizations were allowed to fix prices even higher than reflected by the export markets. Over the years, even with the Government in control of the Reserve Fund, the Fund came to be used to raise prices paid to fishermen. The fund was a convenient mechanism for dealing with economic problems within the fisheries in the 1950's.

By 1959, the Reserve Fund was empty. A return to fish prices based on prevailing export prices would have resulted in a drastic lowering in some fishermen's incomes. Sales organizations therefore appealed to the Government for subsidies on fish prices. The Government entered into negotiations with each of them. Chaos ensued. Thirteen sales organizations claimed subsidies every year, and the Government dealt with each request on an individual basis, and subsidies were given out to each organization. Most probably this spending of money was the most convenient way of handling a political and social problem, without much concern about the long-term impact of this policy.

Later on, in 1964, the Norwegian Government and the Norwegian Fishermen's Association signed the Main Agreement for the fishing industry. Under this agreement, the Fishermen's Association was to represent all the different interests in the fisheries during negotiations over State subsidies.

As will be seen from the opening paragraph of the Main Agreement, it did not only aim at uniting the many interests within the fisheries in one single organization, in order to simplify the negotiations. The main purpose, was to get rid of the whole system of subsidies and transform the fisheries into an ordinary business enterprise, with a normal profitability.

The introduction to the Agreement reads as follows:

> "The authorities and the Norwegian Fishermen's Association have begun closer cooperation with the aim of undertaking whatever measures can expand profitability in the fishing industry, so that fishermen can obtain incomes on a level with those in other occupations, and so that, as a result, the industry can gradually become independent of state support. Both the Association and the authorities will therefore seek to arrange their activities so that this can be attained as soon as possible..."

Price subsidies should, according to the Main Agreement, gradually and within 1968 come to an end. As you will see below, this did not happen.

The Fishermen's Association was given the right to demand negotiations for subsidies when the wage earning ability for well-equipped vessels in full year activity was not considered by the Association to be reasonable in relation to incomes in other industries (which in practice has been the average wage of industrial workers).

2.7 Measures Taken After 1970

On account of the international overexploitation of several fish stocks, and realizing that there could not be an unlimited number of new and alternative fish stocks to harvest from, ther was, around 1970, a change in emphasis and goals in the Norwegian fishery policy, switching from 'how to increase catch and efficiency' to 'how to stop overfishing and limit the growing catch capacity'. I shall comment on some of the most important measures taken in this next phase.

(a) Licensing systems

The need to regulate capacity became evident in the herring fisheries in the late sixties. After severe overexploitation of the stock of Atlanto-Scandian herring, the purse seine fleet started fishing on the North Sea mackerel and herring.

When these stocks some years later showed a decrease in yield, the purse seiners switched to exploiting the huge capelin stock in the Barents Sea. It was a bonanza time for the purse seiners. Naturally the owners wanted to invest in new and larger vessels; and newcomers were eager to establish themselves in this flourishing business. It was feared that a considerable increase in capacity might cause overfishing of the herring, mackerel, and capelin stocks, and also that, even without severe overfishing, a great number of new vessels would mean economic disaster in these fisheries. Hence, in 1972 a special licence scheme for purse seiners was introduced; and since then, no new licences have been issued. Replacement of old or wrecked vessels has, however, been permitted.

In 1972, a special licence scheme for shrimp trawlers was also introduced. Later the saithe fishing fleet has been regulated through the same means. The special licence scheme for the deep sea trawlers, introduced early in this century, has already been mentioned. Virtually all kinds of fishing vessels of more than 90 feet are by now regulated through licensing systems.

(b) Quotas

After the implementation of the 22 n mi economic zones, Norway has entered into close cooperation, regarding fisheries, with its neighbouring countries. Most of the fish stocks occurring within the Norwegian 200 mile zone migrate across national fishing boundaries, making international agreements necessary for effective management. Bilateral fishing agreements have been concluded with the EEC, the Soviet Union, Sweden, the Faroe Islands, and Iceland.

Each year bilateral negotiations over TAC (Total Allowed Catch) for the various stocks, and the sharing of these stocks, take place, based on recommendations from the Advisory Committee of the ICES (International Council for the Exploration of the Seas). The agreed TACs are divided between the negotiating parties.

For most fisheries, the Norwegian catch capacity is much larger than the quota, despite the licensing systems, and the quotas have to be rationed among the vessels in some way or other.

Below, I shall consider the management of cod and capelin in some detail, as these stocks are by far the most important.

Capelin

The regulation system has, in principle, been the same in the years 1979-82. The purse seiners are given about 90 per cent of the quota (winter capelin fishery). This quota is divided into specific vessel quotas. Each vessel gets a quota according to its cargo capacity (which is stated in the licence). The vessel quota increases degressively with the cargo capacity. In 1982 a vessel of 8 000 hl capacity was entitled to a winter season quota only 32 per cent higher than the 4 000 hl vessel. Economy of scale is thus not fully utilized, and the large purse seiners are often laid up only a few weeks after the opening of the season, while smaller vessels make an effort to catch their quotas. The purpose of this quota allotment is to ensure equal incomes among fishermen. Efficiency is to a certain extent being traded off for equity.

Cod

In contrast to the capelin fishery, the allotment is not implemented through vessel quotas, except for the deep sea trawler fleet. The trawler fleet has been regulated by vessel quotas since 1976. In 1977 the cod quota for the trawlers was 54 percent out of the Norwegian cod quota. In 1982 the trawlers were alloted only 29 percent. The trawler quota is apportioned between the trawlers into vessel quotas. Vessel quotas are further split into one 'winter/spring' and one 'autumn' quota, in order to distribute the landings of fish over the year.

The coastal vessels, using handlines, gillnets, longlines, and Danish seine, were in 1982 regulated by (i) three weeks' closing down of the Lofoten fishery (the most rewarding cod fishery), (ii) one summer month's closure of cod fishing in North Norway and (iii) two weeks at the end of the year. The authorities will implement more extensive regulations in 1983. It is nevertheless true to say that the trawler fleet is subjected to stricter regulations than the case is for coastal vessels.

3. THE LONG TERM PLAN

In 1977 the Government submitted a recommendation, in the form of a 'Long Term Plan for the Norwegian Fisheries' to the Storting (Parliament). It was the first time that a comprehensive plan of this kind had been worked out. The Plan attempted to view the various sections of the fishing industry in relation to each other. It attached special interest to the period 1978-81. However, certain guidelines were drawn up for a longer period.

The Plan stated that the goals for the fishery policy must be viewed in the light of overall community development goals. Paramount societal objectives, which occupy a central position in fishery policy context should be:

(a) preservation of the pattern of settlement;

(b) conservation and development of fish resources;

(c) provision of secure and attractive employment opportunities.

The paramount goals, it was emphasized, should be regarded as binding guidelines for political authorities and administrative bodies.

A Comment on Goal (a)

The political justification for the growing governmental support to the fisheries (see below) has more and more been based on the need for creating job opportunities in the sparsely populated regions. Even though there are several other production sectors along the coast, it is the fishing industry that in political documents has got the chief responsibility for conserving the pattern of settlement. To achieve this, the structure in the fisheries should consist of small and decentralized production units, and activities within the fisheries which are not profitable, should be supported by the Government.

A Comment on Goal (c)

In order to create good and secure job opportunities, profitability is necessary. Normally this is achieved by promoting efficiency and productivity. For the fishing industry, however, where income subsidies are a dominant feature, secure workplaces can be achieved by sufficient governmental support. Implicit in the Plan was that the maintenance of secure employment in the fisheries sector could be achieved only if the Government was prepared to sustain financial support, thus giving priority to other objectives than productivity.

A surprising feature of the mentioned paramount objectives in the Long Term Plan is the absence of any goal concerning profitability or productivity. On the other hand, the Plan stressed the need for adjusting both the catch - and the processing capacity to the resource base, which implied a decrease in capacity in nearly all sectors in the fishing industry. Adjustments like the ones suggested in the Plan would improve profitability and raise average productivity.

The Plan indicated that, even with an expected increase in the quota of cod in the Barents Sea, there was an over-capacity in the Norwegian cod fisheries. A stepping down of the factory trawler fleet should be carried through. Even with the optimistic quota outlook which was presented, it was not found advisable to build new fresh fish trawlers beyond the replacing of existing trawlers. Nor did there appear to be any room for a substantial increase in capacity in the fleet of coastal vessels, beyond the increase inherent in technological progress.

According to an analysis, the capacity of the purse seine fleet was too large and the Plan stated that an attempt should be made to reduce it. The possibility of a scrapping programme was mentioned.

An analysis of the fish-oil and fish-meal industries showed an obvious over-capacity, and the Plan suggested that some factories would have to close down.

These adjustments would surely reduce the number of fishermen and jobs related to the fisheries. Therefore it is not surprising that the Plan several times repeats the necessity of giving settlement considerations great weight and of extending capacity adjustments over a reasonable period of time.

The Long Term Plan also discusses several other items. To elaborate on these would, however, go beyond the purpose of this paper.

3.1 Scrapping Programme

As the Long Term Plan had anticipated, the purse seiner fleet got into serious economic trouble, and the State subsidies for that sector of the fisheries were increased. In 1979, the Ministry of Fisheries introduced a scrapping programme for this fleet, offering the owners of old purse seiners up to six million Norwegian kroner if they scrapped their vessels. A smaller grant was offered to those who sold their vessel abroad, or got it employed in a different production sector.

During the period 1979-81 such offers were accepted for almost 60 purse seiners, out of a total of about 250. The total cost for the Government of this operation was N.Kr. 180 million. It was financed as part of the annual agreement, between the authorities and the Fishermen's Association.

As a result of the scrappings or selling off of vessels, the need for supporting purse seiner fleet has decreased considerably. The State will probably have a very substantial long term economic benefit from this programme. Yet, it must be admitted that several people, mainly outside the fishing industry, were astonished, watching on the TV screen a 20-year old, but still fairly good vessel being sunk, and the owner thereby receiving several million kroners from the Government!

A decrease in the participation in the capelin and mackerel fisheries could, of course, be attained just as well by merely reducing state support to the purse seiners, letting the owners of the least profitable vessels go bankrupt. This solution was out of the question for political reasons. And even if it had been chosen, the vessels would still be existing, and could, at the auctions, be bought cheaply enough to make continued operation profitable, which would only have delayed a real solution of the over-capacity problem.

The trawlers in the cod fisheries experienced large deficit, strictly quota regulated as they were after 1976. On account of this, a scrapping and re-financing programme was implemented in 1980 also for the trawlers. Out of about 80 'fresh fish' trawlers, 14 were scrapped or sold off. The governmental expenditure of this programme was N.Kr. 60 million, financed over the annual support agreement. Also in this case the Government will, in the long run, save many times the amount spent, because of the reduction in need for subsidies to the trawlers.

In the course of the last year there has also been appropriated an amount for readjustment of fish production plants, encouraging them to switch over to, for instance, service facilities, provided that the fishing village still has sufficient production capacity available.

3.2 Diminishing Governmental Support and Investment Credit

The Main Agreement (1964) states that 'the Norwegian Fishermen's Association may demand negotiations for support measures when the wage earning ability under normal harvesting conditions for commonly well-operated and well-equipped vessels operating on a full year basis, is not, in the opinion of the Association, in fair proportion to the income in other industries' (§ 6).

Each year the Fishermen's Association has claimed State subsidies on this basis, and each year the Government and the Association have reached an agreement on financial transfers. The greater part of this amount has been used to raise the fishermen's incomes in some way or another. During the period 1964-74 the yearly subsidy was relatively stable. From 1975 onwards, the required amount increased, partly because of the higher prices on fuel (oil), but also because of the weak export markets. On the other hand, higher oil prices meant that Norway, being an oil exporting country, could afford to increase her support to the fisheries.

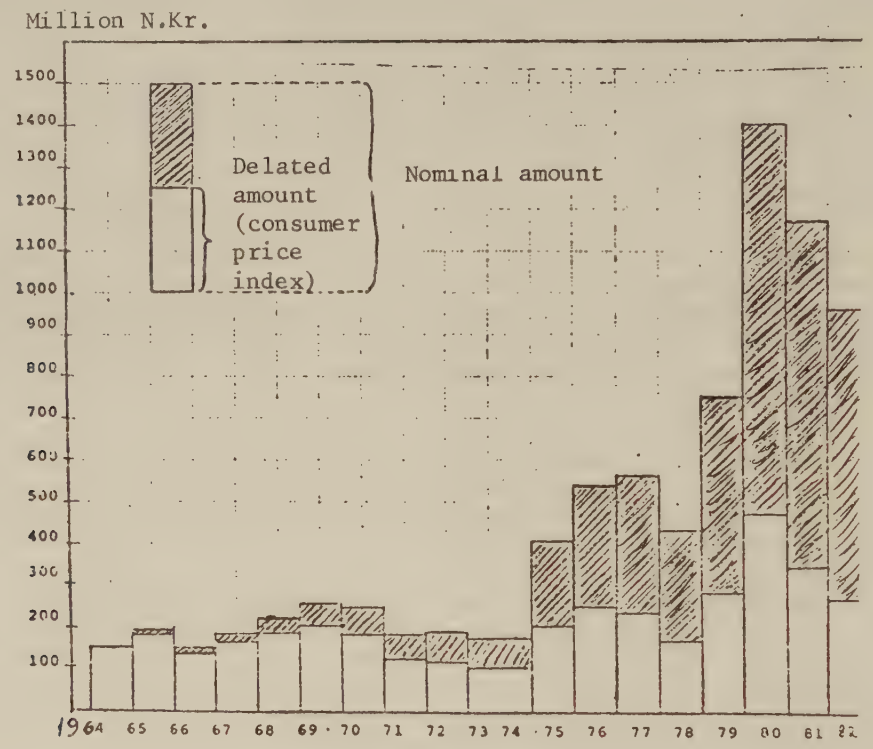

Figure 3 State support to the fishing industry (State credit is not included) 1964-83

Taking the general level of inflation into consideration, the support, in real terms, has steadily diminished since 1980. This is mainly due to two circumstances:

(a) Adjustment of the general economic policy in Norway, stressing the need for limiting the inflation (among the highest in the OECD), reducing the level of public expenditure and balancing the national budget, excluding oil revenues.

(b) Growing awareness of the long-term effects of income transfers on capacity in the fishing industry. It has proved almost impossible to carry through a comprehensive income policy regarding the fisheries, whilst at the same time striving to restrain the fishing effort and avoid depletion of the fish stocks. The casual chain between subsidizing income and the growing fishing effort has become evident. It is, in fact, possible to argue that the over-capacity partly has developed as a result of former generous Government support. In addition to decreased subsidies, the State Bank for the Fisheries got a steadily more restricted loan budget after 1977, in order to reduce the investments in the fishing sector.

4. POLICY EVALUATION

4.1 The Phase of Expansion

Up to about 1960-70 it was relatively easy to be a fishery politician. Certainly, there were problems to face, but there were commonly accepted instruments at hand with which to solve them. Profitability problems could be solved by making subsidies available, or by promoting efficiency by means like specialization of vessels, liberalizing the attitude towards economy of scale, etc. Regional unemployment could be handled almost in the same way: by offering subsidies to the fishing industry, thus stimulating larger quantities of fish and higher investment rates or by promoting efficiency, all designed to make fishing and fish processing profitable for a larger number of vessels and plants. It was possible to solve almost any problem by expansion (expanding catch, number of vessels, number of plants and the size of vessels and plants). Expansion is easy, and it is popular, both among fishermen and politicians.

In the phase of expansion conflicting objectives did exist, but they were far from prominent. Let us for instance consider the resistance to deep sea trawlers and foreign capital about which can be argued that it has delayed the industrialization of the fishery regions; i.e., there was a conflict between the protection of the inshore fisheries and the promoting of efficiency.

Whether this conflict was real, or merely a result of fear and uncertainty among the fishermen connected to the small scale fisheries, is an open question. For one thing, as long as the resource base was virtually unlimited and the fish was exported to foreign markets, on which these quantities had little effect on the price formation, the operation of a number of large vessels, owned by 'capitalists', would neither affect the catch possibilities nor the prices obtained by the coastal fleet. On the other hand, the efficiency in the Norwegian fisheries did increase at a high rate for several decades, at least up to 1970, and the resource basis came to be fully utilized. Furthermore, the standard of living of the rural population in coastal Norway did improve considerably after about 1935, and has continued to do so up till now.

It is, however, impossible to judge whether this was the result of the fishery policy carried through, or whether changing external factors played the dominant role. Improved export markets for fish and an abundance of fish near the coast very often are of greater importance than the fishery policy. Another issue, making the evaluation difficult is that there is no way of separating the policy of fish from the impacts of the increasingly important general regional development programmes in post-war Norway.

It is difficult to avoid the conclusion that the increased income in the fisheries and in fish processing must, at least up to 1960, when subsidies were introduced, be attributed chiefly to improved efficiency in fishing and fish processing, as the markets for food did not improve enough to be an explanatory factor. Whether this progress came because of or despite the governmental measures, is very difficult to judge.

4.2 The Phase of Contraction

When the fish stocks of economic interest are fully utilized, or even overexploited, further increase in efficiency can be achieved only by reducing the amount of the production factors used; either manpower, fuel, gear, or capital. The case is, that, despite fewer fishermen, the fishing fleet grows steadily more efficient, and in order to implement technological improvements, without overexploiting the stocks, the number of fishing vessels has to be reduced. To obtain a decrease in participation in the fisheries, the economic conditions in fishing have to be made less attractive; i.e., income subsidies should be reduced. However, the Fishermen's Association, and several others, claim that this is contrary to the Main Agreement. Such a solution is out of the question, it is argued, also because of the negative impact on settlement along the coast that reduced participation in the fisheries would have.

This illustrates my point; it is far more difficult to carry through a reasonably rational policy in a situation in which expansion is not at hand as a problem solver.

The Long Term Plan had laid the foundation for the scrapping programmes. The political treatment of the Plan had matured the thought of reducing the fishing fleet, despite the supposed negative impact on employment. Still, there has been no scrapping programme for the coastal fleet aiming at reducing the capacity, although there obviously is considerable excess capacity, which the comprehensive fishing regulations planned for 1983 indicate.

The philosophy is that the job opportunities which the excess capacity creates, are well worth their cost. In the long run, however, young people looking for a prospective career, will hesitate to enter a field subjected to strict regulations and without the opportunity of round-the-year activity.

Parallel with the owners of the purse seiners and the fresh fish trawlers being offered grants for scrapping or selling off, these groups of vessels, on equal terms with others, received considerable income subsidies. The Government thus counteracted its own remedy to overcome the severe unprofitability in some sectors of the fishing industry. The administrative bodies were quite aware of this inconsistency. In spite of this, from a political point of view it was considered the best solution.

5. PROBLEMS, OPPORTUNITIES AND LESSONS

On account of the scrapping programme, the total costs in the fishing industry were considerably reduced, without significantly reducing the catch level. The net effect of this measure on the average profitability was obvious. But still the marginal vessel in some fisheries has a negative productivity, as the elimination of one vessel makes it possible to give the rest of the vessels higher average catch per year. The capacity adjustment policy is, consequently, to be carried further in some way or other, though not necessarily through a new scrapping programme.

Analyses show, however, that even with a reasonable balance between national quotas and catch capacity, economic problems will probably arise, at least in some sectors, This is also the current situation in some fisheries which, for the time being, are not subject to quota regulations.

This rather dismal outlook is due to the high inflation in Norway, which together with an increased rate of exchange, makes Norway's competitiveness decline further. This illustrates the link between the development in the fisheries and society in general.

The most important fish stock, the Norwegian Arctic cod, was severely overexploited before the implementation of the 200 mile zones, and despite later regulations implemented both by Norway and the Soviet Union, the stock is still at a very low level. In addition to limited quotas, Norway has, on a unilateral basis, increased the mesh size in trawl from 125 to 135 mm.

The regulation of the capelin stock undertaken by Norway and the Soviet Union has so far been a success. Based on scientific recommendations these two nations have each year agreed upon a quota, and they have stuck to it.

As a consequence of the strict quota regulations implemented in the traditional fisheries, there has been a growing interest for so called 'new' resources, i.e., fish stocks formerly of minor or no interest. To utilize idle capacity in the processing plants, the need for 'new' products has also been stressed, as for instance fish products for direct human consumption from fish traditionally used for reduction to oil and meal. Some of these new resources and new products have already shown a potential for creating new and profitable job opportunities.

The fish farming industry in Norway has had an almost dramatic development since the early 1970's. the excellent natural conditions along the coast combined with the favourable feed situation provides conditions for further growth.

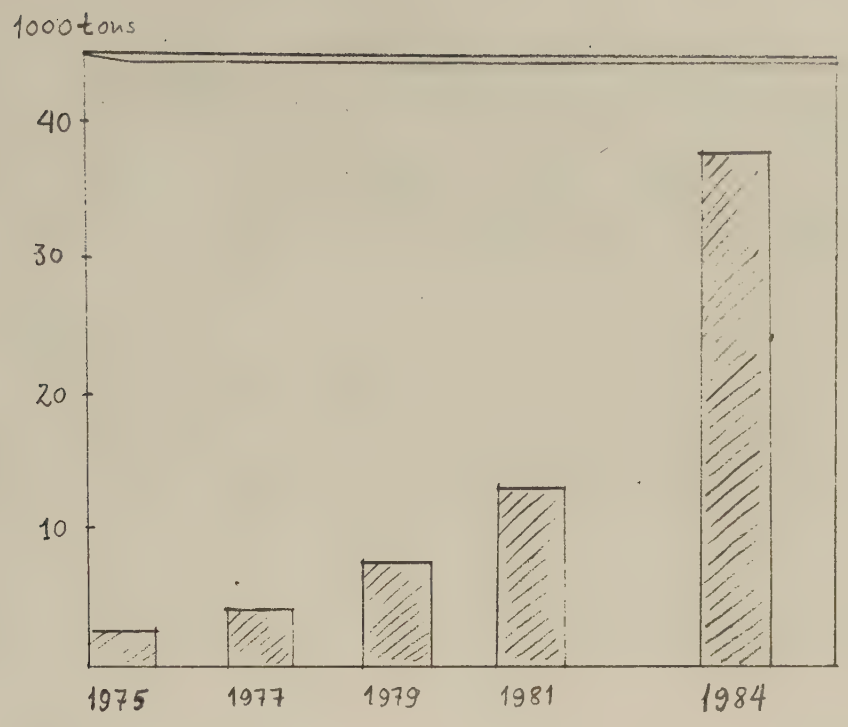

Figure 4 The fish farming industry: development and prediction
(The prediction is based on the fry already in the water)

Even with the optimistic outlook for the fish farming industry, the harvesting of new resources, and the search for new products, the fishing industry will in the future not be able to preserve the pattern of settlement or provide sufficient job opportunities in the coastal area. In addition, young people tend to have more education than they used to, and are not likely to find appropriate employment in the small fishing villages.

A continued tendency toward concentration in the settlement pattern is therefore to be expected, and - in order to prevent migration from the coastal areas in the north - other industries than fishing and fish processing will have to play a more prominent part.

It has become evident that it should not be the responsibility of the fishing industry alone to preserve settlement. The fishing industry should be involved, however, along with other industries. Another lesson to be learned from the Norwegian experience, is that a particular income subsidizing of the fishing industry will, in the long run, inevitably have important negative consequences. In this connection, one should be quite aware that it is very difficult in a society with well organized pressure groups to withdraw a subsidy system already imposed.

Other lessons to be learnt from the Norwegian experiences are:

(1) Over-exploitation should by all means be avoided, even if the appropriate measures taken might cause immediate economic and social problems, since the alternative is a permanently less favourable situation. Restoring a stock is extremely difficult. It has been proved, in Northeast Atlantic waters at any rate, that even strict regulations must continue for quite a long period to give significant results.

(2) A fair balance between catch capacity and the resource base should be sought. Over-capacity often emerges as a result of the continuous technological progress taking place in the fishing fleet. This should, of course, not lead to the conclusion that technological progress is to be prevented. Instead, over-capacity, in the case of limited fish resources, should be avoided by continuously reducing the volume of the production factors involved, as efficiency increases.

(3) The efficiency and the level of technology in the fishing industry should be the average of that prevailing in society in general. This is not necessarily to promote large scale production, since - at least in Norway - the size of the economically favourable unit varies considerably with the circumstances. Reducing productivity in the fishing industry, in order to create more jobs on the basis of limited fish resources will, in the long run, lead to serious problems for the society in general and for the fishery dependent regions in particular.

(4) The implementation of the 200-mile zones has proved to give considerable advantages in the management of the fish stocks in the Northeast Atlantic. Even though important stocks in these waters are harvested too heavily, the situation and the outlook for the future would most probably have been far worse had not the coastal nations been responsible for the management. One should not forget, however, that progress in management demands considerable self-discipline from all negotiating nations, as disagreement about TAC's and their sharing could lead to anarchy and depletion of stocks.

LA PESQUERIA PERUANA
ESTUDIO DE CASO

por

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RESUMEN

1. Situación pasada y presente

En este capítulo se pretende resaltar la actividad pesquera en el pasado, dedicada a garantizar la subsistencia de las comunidades costeñas. En el Perú, esta actividad siempre ocupó un lugar significativo en su devenir histórico, desde su período anterior a la cultura incaica. La experiencia más reciente, sucedida en los años 70, que confirma esta tésis, coloca al Perú a la vanguardia de los países pesqueros, por haber realizado una captura jamás alcanzada por país alguno, esto es, 12,5 millones de toneladas de una sola especie (anchoveta) y en apenas dentro de las primeras 50 millas costeras.

Sin embargo, esta ubicación en la estadística mundial pesquera, no ha significado realmente un beneficio directo para nuestra población, porque seguimos siendo un pueblo con un per cápita de consumo de pescado muy bajo y por tanto, muestra fuerte déficit en el consumo de proteínas de procedencia animal.

Cuando la pesca aportó uno de los mayores porcentajes en el numeral del PBI, paradójicamente, los mayores ingresos sirvieron para la adquisición de alimentos en el exterior. Por otro lado, las poblaciones que sirvieron de base para las operaciones pesqueras, han sufrido los efectos de la contaminación de su medio ambiente natural, han visto deteriosarse su incipiente desarrollo urbano, con un caótico proceso de hacinamiento poblacional, y finalmente muchas de ellas han quedado con sus espectativas de nuevas y mejores oportunidades de trabajo, frustradas y sumidas hoy en sub-empleo y desempleo.

2. Evaluación de políticas, prioridades, estrategias

La acción oficial en las cuatro últimas y más recientes etapas de Gobierno (1968-82) coincide con la sucesión de cuatro Ministros de Pesquería; la actitud de éstos parece expresarse en una curva cíclica, pués unos pretendieron hacer del Pesquero un sector muy importante en la vida económica y social del país, mientras otros, por el contrario, intentaron minimizar esa presencia, desactivando lo que su antecesor estableció, llegando incluso a proponer la desaparición del Ministerio.

Se ha ensayado y pareciera que continúa el trato superficial a una actividad donde se ha invertido ya demasiado capital, a un sector donde se haya comprometida una masa humana que bordean las cincuenta mil familias; e incluso, la Universidad peruana está involucrada con 10 Programas de formación profesional pesquera, con una población que abarca a más de 4 000 alumnos al año.

3. Recursos naturales y medio ambiente

No obstante que se ha dado a los recursos pesqueros el mismo tratamiento que a los recursos mineros, que luego de una intensiva extracción se abandona el socavón depredado; aún cuando el recurso anchoveta padezca lenta y difícil recuperación sin alcanzar, tal vez nunca más el volumen de stock disponible de las décadas del 60 y 70, existe gran variedad de especies que no son aplicadas para el consumo humano, por desconocimiento.

Vale recordar, que la riqueza hidrobiológica peruana no sólo es habida en los cuantiosos recursos que generosamente ha colocado la naturaleza en el mar, sino que también se debe tomar en consideración todos los espejos de agua ubicados en la sierra y amazonía; lamentablemente, la biomasa allí existente ha corrido la misma suerte que la marítima por la acción depredadora; tal es el caso de los llamados peces ornamentales.

La falta de recursos financieros así como la ausencia de investigación en el campo de la contaminación ambiental, ha permitido hasta ahora, una actitud pasiva frente a la peligrosa y creciente contaminación del ambiente atmosférico y de los cursos de agua, poniendo en nivel de riesgo a la vida del planeta y a sus habitantes.

4. La pesca artesanal

Se ha dado muy poca atención a la pesca artesanal, aún cuando ella garantiza el abastecimiento del mercado interno, según la información sobre el desembarque de este tipo de actividad y el consumo nacional, de productos al estado fresco.

El pescador artesanal, con apenas el conocimiento transferido desde sus ancestros a través de la tradición, se halla en condición bastante disminuida, desde el punto de vista social, económico y cultural, con respecto de otras fuerzas del trabajo, inclusive dentro del mismo sector. El aumento en los precios a los productos pesqueros que paga el consumidor no benefician en forma significativa a los pescadores y sí más bien, el gran beneficiado resulta ser el intermediario.

A diferencia de lo que se conoce como la pesca industrial, en la artesanal el pescador es casi autónomo o forma parte de un grupo familiar y hasta cooperativo; este tipo de actividad permite el empleo intensivo de la mano de obra; mientras que cuando se trata simplemente de inversiones concentradas, que van a la procura de la producción masiva, de tecnología avanzada y sofisticada, se logra tal vez mayor productividad pero con el empleo de cada vez menos mano de obra.

5. La cooperación técnica

La tesis expuesta de que siendo la pesca peruana una pesca dirigida a la exportación, su industria entonces debería en estos momentos poseer una variada y gran riqueza tecnológica; sin embargo, esto no sucede así, agregado a ello, que por muchos años la industria dedicó sus más caras preocupaciones en sólo la producción de harina y aceite de pescado, descuidando la actividad en la producción conservera.

La investigación tecnológica en el Perú debería estar recibiendo apoyo intensivo y directo de todos los países que son grandes mercados consumidores de productos pesqueros, pero no sucede esto y más bien pareciera que tan sólo se pretende obtener resultados para un mercado exclusivo, que no es nuestro principal cliente, ni tampoco se trata de beneficiar con ello el consumo popular nacional.

Se puede mencionar el caso del Instituto Tecnológico Pesquero, único en su género en el país, que a pesar de haber transcurrido ya más de 30 meses desde su creación e inicio de las investigaciones, que cuenta con una veintena de expertos nacionales especializados en el Japón y con una extraordinaria infraestructura, incluso asesorados por sucesivos convenios de asistencia técnica internacional; hasta hoy, no se siente su presencia en la vida activa nacional, ni menos por supuesto sus efectos para el mejoramiento de la dieta popular.

6. Conclusiones y recomendaciones

Se propone sintetizar algunos elementos de juicio que nos permitan establecer el potencial del sector para una estrategia nacional, partiendo del hecho que el Perú cuenta con los recursos hídricos suficientes y apropiados para desarrollar, por ejemplo, una política de acuicultura marítima, lacustre y fluvial.

A pesar de la cercana y pretérita depredación masiva de algunas especies, existe todavía una gran variedad y volumen de otras, suficientes para garantizar el abastecimiento del consumo nacional y además, participar con su aporte de alimentos, en la tremenda lucha para aplacar el hambre de la humanidad.

En el Perú, la pesca es un sector donde pueden darse resultados positivos incluso en el corto plazo, si se realizan acciones empresariales realistas, oportunas y empleando armonicamente todos los recursos que intervienen en la producción.

Se propone también que las nuevas inversiones que realice el Gobierno, con recursos nacionales y procedentes del crédito internacional, sean orientadas a procurar mayores oportunidades de trabajo a la mano de obra intensiva, esencialmente en el campo de la pesca artesanal.

Que es necesario y urgente una reestructuración de los organismos oficiales, estableciendo claramente sus funciones. Que necesita el país contar con una flota pesquera nacional, establecida técnicamente. Que es importante el reordenamiento de la actividad industrial. En fin, que la investigación científica y tecnológica reciba un mayor apoyo para lograr así el empleo racional e integral de los recursos. Y, que se establezca un sistema nacional de capacitación sectorial, especialmente para los mandos medios.

1. BREVE DESCRIPCION DE LA SITUACION PESQUERA PASADA Y PRESENTE

Para hablar de la pesca en el Perú, tenemos que remontarnos, tal vez, al nacimiento del país. Los peruanos tenemos un distante pasado pesquero que se atisba desde su amanecer histórico en las costas del Pacífico y se afirma en las aguas mediterráneas.

Los museos nacionales y extranjeros exhiben muestras fehacientes de una grandiosa cultura pesquera pre-Inca, cuyo mensaje no totalmente descifrado nos relata parte de la experiencia y tecnología aplicadas en la obtención de los recursos marítimos, que satisfacieron las demandas alimentarias de aquellas poblaciones.

No se conoce, ciertamente, cuáles eran las metas trazadas por los gobernantes de las culturas precolombinas, pero sin embargo, investigaciones realizadas por estudiosos de la historia nos muestran que la dieta de las poblaciones costeras se basaba esencialmente en los productos del mar; incluso, dicen los cronistas españoles, que era muy natural abastecer al Inca con productos de la Costa, frescos o casi vivos, transportados por los "chasquis" hasta el Cuzco, distante más de 350 km en línea recta.

A diferencia con la historia temprana del Perú, en las últimas décadas, inclusive en los años de mayor producción pesquera, la pesca apenas si alcanza un mediano porcentaje en la dieta del poblador peruano, muy deficiente por cierto en cuanto al consumo de

proteínas, debido a que la mayor producción de la pesca se ha orientado más bien hacia la industria para el consumo humano indirecto y esencialmente para la exportación.

El presente pesquero nacional se refleja en el gran potencial de la fauna y flora de su mar territorial, así como de las numerosas reservas acuáticas de los valles interandinos y de la amazonía. En las décadas del 50, 60 y 70 la pesca alcanza un rol muy importante en la vida económica del país, principalmente en el año 1970, cuando el Perú se convierte en el primer país pesquero del mundo, al haber obtenido una captura que sobrepasó los 12,5 millones de toneladas, cifra esta que jamás ha sido lograda por país alguno ni antes ni después. De haber sido empleada esta producción para el consumo humano directo, se podría haber resuelto en esa fecha el hambre de una población mayor que la del continente americano, con un consumo per cápita mayor que los 21 kg.

La riqueza del mar peruano, aún después de haber sufrido acción depredatoria por la realización de pesca descontrolada, es sin duda alguna de carácter extraordinario, pero exige el establecimiento de una política gubernamental clara y precisa de custodia en defensa de las especies.

Lamentablemente, en las dos últimas décadas, cuando se han expresado políticas y estrategias, éstas han resultado imprecisas cuando no contradictorias.

Si, se sabe, por ejemplo, que el Gobierno actual no desea permitir el crecimiento de la actividad estatal en la explotación de los recursos naturales y la tecnología, porque ha decidido que la actividad empresarial sea de única responsabilidad de la iniciativa privada, aún cuando esta decisión se contradice con el pluralismo económico que la Constitución garantiza (art. 112) y, que a la letra señala en su art. 113º "El Estado ejerce su actividad empresarial con el fin de promover la economía del país, prestar servicios públicos y alcanzar los objetivos de desarrollo".

También señala la Constitución en su art. 114º "Por causas de interés social o seguridad nacional, la ley puede preservar para el Estado actividades productivas o de servicios."

Con la "racionalización de la actividad pesquera", no se conoce que se pretende conseguir:

- aumento en el consumo *per caput* de productos pesqueros;
- aumento de la producción y productividad, en base a una mayor y mejor explotación de los recursos naturales, y de la aplicación de nuevas tecnologías;
- incremento del ingreso de divisas para mejorar la balanza de pagos;
- incremento del pleno empleo mediante la realización de nuevos programas de inversión, cuando el Gobierno central exige mayor austeridad en el gasto público;
- ¿se orientará al Sector, con la nueva ley de Pesquería, a la aplicación de capitales para el uso intensivo del capital?
- con la autorización para el incremento de la flota arrastrera, ¿se garantizará el trabajo de los pescadores artesanales y también se garantizará la defensa de los recursos hidrobiológicos de la plataforma marina?

En fin, se presentan muchas interrogantes, que esperan ser resueltas y que existe aún la esperanza que las cámaras legislativas tomarán en cuenta para garantizar una pesca racional, la defensa de los recursos hidrobiológicos, mayores plazas de trabajo y estabilidad laboral, mejor distribución del ingreso; mayor y mejor abastecimiento de la población peruana y a precios que se hallen a nivel del poder adquisitivo durante todo el año; controlar la actividad industrial privada que produce más harina y aceite de pescado y menos conservas y ninguna promoción del mercado interno; asegurar que la investigación científica y tecnológica servirá para orientar las acciones de la burocracia oficial; que las investigaciones tecnológicas beneficien directamente a la población con nuevas formas de presentación de los productos, para incrementar el consumo *per caput* de proteínas de procedencia hidrobiológica.

1.1 Nuevo Derecho del Mar

Desde 1945, tanto el Perú como Chile realizaron declaraciones individuales sobre usos y jurisdicción marítimos ante la ausencia "de una legislación oportuna" que abordase la renovación del Derecho del Mar. El Perú mediante al Decreto Supremo Nº 781 de fecha 1 de agosto de 1947, expresa la necesidad de "... fijar de una manera inconfundible el Dominio Marítimo de la Nación, en ejercicio de la soberanía y en resguardo de los intereses económicos nacionales".

El Presidente de aquella época, al prologar la Historia Marítima del Perú, obra auspiciada por el Ministerio de Marina, Dr José Luis Bustamante y Rivero, tocando el tema de la terminología más apropiada para designar en el nuevo Derecho del Mar a las 200 millas proclamadas por el Perú, manifiesta: "No es razonable el intento de desterrar ese apelativo de mar territorial, que sobre hallarse universalmente divulgado y admitido, no puede ser tildado de impropio o inadecuado, ya que por el contrario, enuncia mejor que ningún otro la idea de cosa integrante o complementaria del territorio y dotada de las mismas características jurídicas que éste en cuanto dependencia del Estado".

En la presentación de esta misma obra, en el año 1972, el Ministro de Marina se expresa: "La Historia Marítima del Perú nutre y complementa los anticipos de una epopeya sin estridencias, recatada, anónima, tesonera y porfiada: nos referimos a la ocupación del territorio total de la Patria, que empieza en los límites de 200 millas mar adentro". (Vice-Almirante Vargas Caballero, Luis E. - Historia Marítima del Perú, Introducción, pág. XVIII).

Con la Declaración de Santiago, suscrita por el Perú, Chile y Ecuador, se inicia la defensa conjunta de los derechos de soberanía de los estados ribereños en una lucha permanente que va ganando cada vez más adherentes; hasta que en 1963, las Naciones Unidas deciden realizar esfuerzos conjuntos para "la elaboración de una carta para los océanos del mundo" (Boletín de Prensa de las Naciones Unidas).

"Tras 9 años de negociaciones, por falta de consenso, la Tercera Conferencia de las Naciones Unidas sobre el Derecho del Mar, vota sobre el texto de 320 artículos" la Convención sobre el Derecho del Mar aprobándola por 130 votos; sin embargo hubieron 4 votos en contra (Estados Unidos de Norte América, Israel, Turquía y Venezuela) y 17 abstenciones (casi la totalidad de países europeos y la Unión de Repúblicas Socialistas Soviéticas).

Luego de este acuerdo, en el mes de abril de 1982, se han presentado dificultades al grupo de países considerados como "territorialistas" para la suscripción definitiva del Convenio el próximo mes de diciembre de este mismo año.

En el caso del Perú, uno de los tres países de la Declaración de Santiago en 1952, que declararon la soberanía y jurisdicción de manera exclusiva sobre las 200 millas de mar ribereño, se está produciendo un debate nacional sobre si conviene o no autorizar la adhesión final al texto, que fue suscrito por la delegación peruana con el carácter de ad-referendum.

Tanto en las filas parlamentarias del Partido de Gobierno como en la opinión de los más importantes juristas nacionales, no existe unidad de criterio frente a la conveniencia o no de la Convención, tal aparece aprobada. El Ministro de Relaciones Exteriores manifiesta su preocupación públicamente, que en el caso de que no se suscriba la Convención el Perú quedaría al margen de los beneficios que ella conlleva y estaría indefenso y sin amparo frente a la necesidad de defender sus riquezas contra la depredación y contaminación marítima. También señala que es muy importante la presencia del Perú en la obtención de los beneficios resultantes de la explotación del área considerada patrimonio común de la humanidad.

Hay en estos momentos una gran movilización de los organismos políticos, así como de instituciones sociales y culturales, incluso los sindicatos de pescadores, con la finalidad de evitar que el Gobierno se comprometa con la adhesión definitiva a un instrumento legal de carácter internacional, tal, que está en contradicción con la Carta Magna del Perú, que en su Capítulo III referido al territorio, establece:

"Artículo 97° - El territorio de la República es inviolable. Comprende el suelo, el subsuelo, el dominio marítimo y el espacio aéreo que los cubre".

"Artículo 98° - El dominio marítimo del Estado comprende el mar adyacente a sus costas, así como su lecho y subsuelo, hasta la distancia de 200 millas marítimas medidas desde las líneas de base que establece la ley. En su dominio marítimo, el Perú ejerce soberanía y jurisdicción, sin perjuicio de las libertades de comunicación internacional, de acuerdo con la ley y los convenios internacionales ratificados por la República".

"Artículo 99° - El Estado ejerce soberanía y jurisdicción sobre el espacio aéreo que cubre su territorio y mar adyacente hasta el límite de las 200 millas, de conformidad con la ley y con los convenios internacionales ratificados por la República".

La necesidad de divulgar el texto completo de la Convención sobre el Derecho del Mar, es una exigencia de los partidos políticos de la oposición, así como también de la prensa nacional. "Es necesario, dice el representante del partido de gobierno, que se apruebe por consenso en el Parlamento Nacional, de lo contrario es preferible que no se firme", cuando se refiere a la próxima ratificación del Convenio.

No hay entonces aún en el Perú, concordancia sobre los criterios de mar territorial hasta una anchura de 12 millas, zona económica exclusiva y plataforma continental, enunciados en la Convención. Pero sí parece primar, el que se refiere a la defensa conjunta de los derechos establecidos en la Constitución Política del Perú.

1.2 La Crisis del Combustible

En cuanto al combustible se trata, el Perú felizmente es un país autoabastecido de productos petroleros, y no sólo eso, sino que tiene un potencial aún no explotado totalmente.

Sin embargo, la pesca al igual que las demás actividades deben verse afectadas permanentemente por el contínuo incremento en el precio de los combustibles. Es política del actual Gobierno, realizar alzas periódicas de los combustibles, hasta que el precio de la gasolina de menos octanaje tenga el valor equivalente a US$ 1,25 el galón, y, con ello suben también en la misma proporción todos los demás combustibles, aceites y lubricantes; y como es lógico suponer, siendo que se aplica el sistema de mini-devaluaciones diarias a nuestra moneda, so pretexto de con ello coadyuvar a combatir la inflación, entonces no se vislumbra cuándo se va a alcanzar la meta señalada y dar estabilidad a los precios de los combustibles.

Hay presente una demanda de los armadores de la pesca para consumo humano directo, en el sentido que el combustible aplicado en esta actividad no debe verse afectado por la misma política que se aplica al transporte en general, y más bien tener un precio menos para no afectar tanto, como resultante, el precio de los productos pesqueros que sirven para la alimentación popular.

Hay que hacer aquí una aclaración con respecto a la meta que se ha propuesto el Gobierno para el precio de los combustibles; y, no es que sea muy alto el costo de producción de los mismos que no alcanzamos a financiarlo con los valores actuales, sino que el sobreprecio a los combustibles ayuda a financiar el presupuesto del Gobierno central, que se aprueba siempre con déficit de entrada.

2. EVALUACION DE POLITICAS ACTUALES, PRIORIDADES, ESTRATEGIAS

Es conveniente precisar que el análisis que procedemos a realizar a continuación abarca un período de aproximadamente 12 años y que comprende las dos etapas del Gobierno militar (1968-80) y lo que va de corrido del actual Gobierno democrático, a partir del mes de julio de 1980 a la fecha.

Durante el Gobierno militar y desde la creación del Ministerio de Pesquería, se han sucedido tres ministros militares y cinco vice-ministros, civiles los tres últimos. Y, desde la asunción del Gobierno civil y democrático, tan sólo se ha nominado un ministro y un vice-ministro.

2.1 De 1968 a 1970

No obstante que en el año 1974 recién fue dado a conocer el Plan de Gobierno de los militares, conocido como el "Plan Inca", en este documento se proponía para la pesca el siguiente objetivo: "Explotación de la riqueza hidrobiológica del país al máximo compatible con su preservación, reservando para el Estado la extracción y transformación en gran escala y la comercialización externa".

En el mismo documento se señalan las siguientes acciones:

(i) crear el Ministerio de Pesquería;

(ii) establecer los organismos que se encarguen de la extracción y transformación en gran escala y de la comercialización externa de todos los productos hidrobiológicos;

(iii) racionalizar la pesca industrial y reducir la capacidad instalada en exceso;

(iv) impulsar al máximo la pesca para el consumo humano en el país y para la exportación;

(v) crear la infraestructura adecuada para una explotación masiva;

(vi) organizar una flota para el transporte de la riqueza hidrobiológica;

(vii) consolidar la industria y aumentar su productividad, y

(viii) desarrollar la investigación científica y tecnológica.

2.2 De 1970 a 1975

Esta es en realidad la primera época en la historia oficial de la pesquería peruana, en la que se planifica y se establecen programas de proyectos específicos, porque coincide con la aparición de un ente estatal responsable de este sector.

Entonces, para un mejor ordenamiento, haremos un paralelismo con las proposiciones enunciadas en la época anterior, así:

(i) Se crea el Ministerio de Pesquería por Decreto Ley N° 18026 del 16.12.1969; se aprueba la Ley Orgánica del Ministerio de Pesquería por D.L. N° 18121 del 27.1.1970.

(ii) Se crea la EPSEP (Empresa Pública de Servicios Pesqueros del Perú) para que se encargue de la promoción de la pesca para consumo humano directo, así como del abastecimiento del mercado nacional con productos hidrobiológicos; por D.L. N° 18252 dictado en el año 1970;

Se crea la Empresa Pública para la Elaboración de Harina y Aceite de Pescado PESCA-PERU, como monopolio del Estado como consecuencia de la estatización de la industria dedicada a esta actividad, considerando la flota y las plantas de procesado, y toda la masa laboral que de ella dependía directamente. Por D.L. N° 20000 en el año 1973.

Se crea EPCHAP, Empresa Pública de Comercialización de Harina y Aceite de Pescado, por D.L. N° 18212 del 7.4.1970, y cuya Ley Orgánica se dicta el mismo año mediante D.L. N° 18253.

(iii) Se dicta la Ley de Pesquería, que norma la actividad y ámbito del Sector, por D.L. N° 18810 del 29.3.1971. Se declara la racionalización de la industria pesquera dedicada a la fabricación de la harina y aceite de pescado, dando de baja a las embarcaciones obsoletas y cerrando las fábricas cuyas instalaciones son totalmente ruinosas e ineficientes. También se declaran las temporadas de pesca y las vedas de la pesca de anchoveta.

(iv) Se establecen los convenios de pesca conjunta, con Cuba y Polonia, para incrementar la oferta de pescado a la población nacional, mediante el establecimiento de una cuota mínima de captura para el mercado interno, por intermedio de la Empresa Pública de Servicios Pesqueros; el excedente, que sobrepasaba el 80%, era comercializado al exterior por la EPSEP.

Tanto Polonia como Cuba participaban con embarcaciones arrastreras y el convenio incluía la participación progresiva de tripulación nacional.

(v) Pasa al sector pesquero el IMARPE (Instituto del Mar del Perú) y se le encarga la responsabilidad de realizar las investigaciones científicas y tecnológicas en el mar y en aguas continentales. Esta institución había estado dentro de la Marina de Guerra del Perú.

Se crea la Empresa Pública de Certificaciones Pesqueras, CERPER, a la cual se le señala como rol el control de calidad de los productos pesqueros desde su extracción, pasando por los procesos de transformación hasta su presentación como producto terminado, esencialmente para el mercado externo.

Se inicia un programa de construcción de terminales pesqueros en algunas caletas de pescadores artesanales del litoral marítimo; así como, también la construcción y funcionamiento de frigoríficos pesqueros para la recepción, almacenamiento, redistribución y comercialización en el interior del país.

Se realizan estudios para la instalación de tres puertos con sus respectivos complejos pesqueros; se procede a iniciar la construcción de los mismos y finalmente se procede a conformar empresas mixtas para la administración del complejo pesquero de Paita, el primero en entrar en funcionamiento.

Se recuperan algunas instalaciones de piscicultura en la sierra y se construyen otras, para promover la pesca interior o pesca continental.

Se establece un programa de capacitación pesquera para los pescadores de la industria de consumo humano indirecto y para los de la pesca artesanal. También se da inicio a un programa de "prácticas vacacionales" para los estudiantes universitarios de pesquería, como condición previa a la culminación de sus estudios. Se promueve un programa de reciclaje para algunos funcionarios y profesionales del sector, mediante estudios en universidades e instituciones públicas y privadas del exterior. Se autoriza la elaboración de estudios para establecer un programa de capacitación sistematizada para los mandos medios, a nivel nacional.

(vi) Se construyen algunos barcos del tipo graneleros, para la exportación de la harina de pescado. También se pretende establecer una flota atunera peruana con embarcaciones construidas en astilleros peruanos, como las anteriores. Se adaptan algunas embarcaciones anchoveteras, convirtiéndolas para la pesca de consumo humano directo, a cargo de la EPSEP, que amplía de este modo su campo empresarial.

(vii) El Estado pretende sustituir a la inversión privada, bastante retraída, de modo que se transforma en el más grande empresario, pero no afecta positivamente el desarrollo de la pesca artesanal, ni tampoco llega a sustituir a la industria envasadora.

(viii) Se autoriza la elaboración de los estudios para la instalación de un instituto que se dedique a la investigación de las tecnologías más apropiadas para los productos elaborados para el consumo humano directo y el mejor aprovechamiento de las especies tan variadas del mar peruano.

Se refuerza la posición peruana en defensa de la tesis del mar territorial de las 200 millas marítimas, considerándolas como la cuarta región del Perú en los nuevos textos de enseñanza.

2.3 De 1975 a 1978

Esta época que coincide con el segundo Ministro de Pesquería, se caracteriza porque:

(i) Se pretende desactivar al sector para luego transferirlo o reintegrarlo al sector agricultura.

(ii) Se ordena la paralización progresiva de las actividades en los terminales y frigoríficos pesqueros, a nivel nacional.

(iii) Se restringe al mínimo el apoyo a los programas de inversión.

Se reprivatiza la actividad pesquera en la fase de la extracción, creando las PEEA o Pequeñas Empresas para la Extracción de la Anchoveta con la transferencia de todas las embarcaciones de la flota de PESCA-PERU.

Con la racionalización de la industria para consumo humano indirecto, también se transfiere a la actividad industrial privada a los pescadores anchoveteros, Decreto Ley Nº 21558.

Se dan incentivos para que los trabajadores de las plantas de transformación de Pesca-Perú, se retiren de la actividad laboral del Estado y se trasladen a otra actividad económica.

(iv) Se autoriza la pesca de otras especies diferentes a la anchoveta, para producir harina y aceite de pescado, de modo de lograr estabilidad a las nuevas empresas. Con ello, el Gobierno, al igual que sucedió cuando aún no se había creado las autoridades oficiales del Sector, y en su afán de lograr el incremento de divisas para la adquisición incluso de alimentos importados, repunta el volumen para la industria de consumo humano indirecto.

Esta actitud, permite por un lado la aplicación de las especies sardina y agujilla para la producción de harina y aceite de pescado, así como también especies "de mesa", como la merluza, jurel, etc. Por otro lado, empieza a escasear, por supuesto, el pescado de mesa y a aumentar de precio a niveles nunca antes vistos.

(v) Se cancelan los convenios de pesca con Polonia, pués el que se tenía con Cuba ya había sido concluido en el período anterior. Pero, cosa curiosa, se autoriza el empleo de dichas embarcaciones (arrastreros polacos) a formar parte de empresas nacionales, incluso se permite el incremento del número de arrastreros.

(vi) No habiendo podido desarticular totalmente al Sector, entonces se procede a privatizar la actividad extractiva, la comercialización interna, e incluso se permite la quiebra de las empresas mixtas, para luego transferirlas a la actividad privada, un tanto sub-valuadas; algunas instalaciones frigoríficas también se transfirieron al sector privado, mediante el regimen de alquiler.

(vii) Finalmente, se ordena valorizar las inversiones realizadas en algunos proyectos inconclusos, como es el caso del primer centro de entrenamiento pesquero de Paita, para su posterior urbanización y adjudicación en venta a la iniciativa privada como terrenos industriales, cosa que no se cristalizó.

2.4 De 1979 a 1980

El último ministro del régimen militar tuvo un período de apenas un año y medio, pues en julio de 1980 entregó el cargo al primer Ministro de Pesquería del régimen democrático.

Cuando todo hacía suponer que el ministro militar completaría el desmantelamiento de la actividad estatal pesquera, se procede a realizar las siguientes decisiones:

(i) Se establece la política del sector pesquero, donde se prioriza el abastecimiento del mercado interno con productos para consumo humano directo e indirecto, debido esto último al constante incremento de la demanda, para abastecer a las granjas avícolas y ganaderas del país.

(ii) Se procede a reforzar a la Empresa Pública de Servicios Pesqueros, para realizar una agresiva campaña de abastecimiento con productos de bajo precio a los mercados populares; acompañada así mismo por la campaña de educar a la población consumidora, mediante el personal de la Oficina de Educación al Consumidor, dependiente directamente del Ministro; ente creada por el primer Ministro de Pesquería.

(iii) Se continúa con la racionalización de la industria harinera, parcialmente en poder del Estado, aunque siempre permitiendo la pesca de otras especies distintas de la anchoveta, por la aún no recuperación de esta especie.

(iv) Se busca nueva financiación para proyectos de apoyo a los pescadores artesanales, donde se instalarían productores de hielo y facilidades para el desembarque de productos.

(v) Se instalan nuevos sistemas de pesca en las aguas continentales para la truchicultura, especialmente en el lago Titicaca, en el altiplano Perúboliviano.

(vi) Se concluye la edificación y equipamiento de las instalaciones que servirán de sede del nuevo Instituto Tecnológico Pesquero del Perú (ITP), creado por D.L. Nº 22642 y cuya Ley Orgánica promulgada por D.L. Nº 22798, le señalan la responsabilidad de "Planear, dirigir, coordinar, fomentar y ejecutar investigaciones tecnológicas ..., orientadas al desarrollo de una tecnología propia acorde con nuestra realidad", para lograr "el aprovechamiento integral y la óptima calidad" de los productos destinados al consumo humano directo, "provenientes del mar y aguas continentales". También se crea esta institución pública descentralizada "para contribuir a elevar el nivel nutricional de la población, mediante la elaboración de productos de alto valor nutritivo y bajo costo".

(vii) Se inaugura el primer barco científico "HUMBOLDT" contruido en el Perú y equipado con los últimos adelantos para tan importante misión, con el apoyo de la República Federal de Alemania.

2.5 De 1980 a 1982

Con la transferencia del poder de los militares al Gobierno elegido democráticamente, asume el portafolio de Pesquería un nuevo Ministro y por consiguiente, un nuevo Plan de Gobierno. Hay espectativa por conocer cuál será la política que asumirá este nuevo conjunto de personas que tienen la responsabilidad del Sector; sin embargo, por la conformación ideológica de los partidos aliados para gobernar, no se esperaba una tendencia estatista en la actividad pesquera, pero, por su procedencia, lo menos que se esperaba es que cumpliera la prescripción constitucional de defensa de los recursos naturales, así como también, defender la inversión estatal ya realizada. Bueno, hasta lo que va de transcurrido el presente régimen democrático, se han producido las siguientes acciones de política:

(i) Se paraliza toda actividad en los terminales pesqueros e inclusive, en la única empresa pesquera estatal de mayor envergadura, situada en el complejo pesquero de Paita.

(ii) Se minimiza la acción estatal en las actividades pesqueras para consumo humano directo. Se plantea una reorganización en todas las instituciones del sector. Se declara la necesidad de reducir el gasto burocrático, disminuyendo progresivamente el volumen de trabajadores dependientes del Gobierno, pero éstos, nuevamente son sustituidos por personal adicto al nuevo régimen de gobierno.

(iii) Se ofrece incentivos económicos para que los trabajadores pesqueros renuncien a depender de las empresas del Estado, pero no se logra la meta pretendida de reducir al 40% el volumen de trabajadores de Pesca-Perú, por ejemplo.

(iv) Se autoriza el gasto sólo para concluir las obras que habían sido iniciadas en el régimen anterior.

Posteriormente, se gestiona crédito externo (BID, Japón, e Italia) para reiniciar las inversiones en pequeños proyectos de terminales pesqueros, con facilidades de abastecimiento de hielo y desembarque, en las caletas de pescadores artesanales.

(v) Se realiza un primer intento por controlar la actividad de las embarcaciones arrastreras, incluso, se dijo, por ser perjudicial para la flora y fauna marinas del país; pero posteriormente, se autoriza el incremento de la flota arrastrera, para que pesque con bandera nacional formando parte de las empresas privadas peruanas.

También se gestiona la adquisición de pequeñas embarcaciones japonesas para la pesca de consumo humano directo, para incrementar la flota de la pesca costera.

(vi) Se autoriza a las empresas conserveras, la producción de harina y aceite de pescado no sólo con residuos sino también con "excedentes" de la pesca de consumo humano directo. Esta es una actividad que vuelve al sector privado después de nueve años de prohibición.

(vii) Se renueva la autorización de pesca de otras especies diferentes a la anchoveta, "hasta que ésta recupere su nivel de explotación", incrementándose de este modo la producción de harina y aceite de pescado.

(viii) Se declara la necesidad de transferir toda la actividad empresarial del Estado hacia la iniciativa privada, dada la tremenda "carga deficitaria que significa la empresa estatal", que "incrementa la inflación".

Esta actitud ha generado un debate nacional, que se dilucidará en el Congreso de la República, enfrentando a la oposición que exige se respete el mandato de la Constitución del Estado, que consagra el "pluralismo económico" y los partidos de gobierno de tendencia privatista.

(ix) Se está gestionando la promulgación de una nueva Ley de Pesquería para dar un marco legal a todas las directivas emitidas por el nuevo Ministro de Pesquería en este también nuevo régimen pesquero. Incluso, en la nueva legislación se

propone una diferente clasificación de la actividad laboral, distinguiéndose sólo al pescador artesanal del pescador industrial; con ello se elimina aquello de industria para el consumo humano directo e industria para el consumo humano indirecto; no habrá pués diferenciación de pescadores cuando la propia industria conservera realiza ya reducción del pescado para producir harina y aceite.

3. RECURSOS NATURALES Y MEDIO AMBIENTE

Antes de referir la situación de los recursos hídricos e hidrobiológicos en el Perú, expondremos las prescripciones constitucionales, sobre el tema:

"Artículo 118° - Los recursos naturales, renovables y no renovables, son patrimonio de la Nación.

Los minerales, tierras, bosques, aguas y, en general, todos los recursos naturales y fuentes de energía pertenecen al Estado. La ley fija las condiciones de su utilización por éste y de su otorgamiento a los particulares".

"Artículo 119° - El Estado evalúa y preserva los recursos naturales. Asimismo, fomenta su racional aprovechamiento. Promueve su industrialización para impulsar el desarrollo económico".

"Artículo 123° - Todos tienen el derecho de habitar en ambiente saludable, ecológicamente equilibrado y adecuado para el desarrollo de la vida y la preservación del paisaje y la naturaleza. Todos tienen el deber de conservar dicho ambiente.

Es obligación del Estado prevenir y controlar la contaminación ambiental".

Ahora bien, teniendo como marco estos dictados de la Constitución, realizaremos una revista a los recursos hídricos y biológicos del país, separándolos hasta donde sea posible en dos zonas, a saber, la marítima y la continental.

3.1 Recursos Marítimos

El mar peruano, constitucionalmente, es un ámbito que frente a una faja costera de alrededor de 2 800 km se extiende a una distancia de 320 km (200 millas marítimas) desde su orilla; el área que abarca, equivale aproximadamente al 60% de la superficie de la zona continental, y forma parte del océano más extenso del planeta.

La extraordinaria actividad biológica dentro de este ecosistema, "que hace de esta área oceánica una de las más productivas del mundo", se debe seguramente al alto contenido de nutrientes descubierto por los científicos en la corriente peruana y al aporte orgánico y mineral, de la veintena de ríos costeros que proceden de la Cordillera de los Andes; dentro de este mar se desarrollan muchas comunidades de seres vivientes "que suelen distribuirse en tres grandes grupos":

(i) el plancton: fitoplancton y zooplacton;

(ii) el bentos: dentro del cual se hallan las algas, esponjas, poliquetos, crustáceos, decápodos, equinodermos, lamelibranquios y algunos grupos de peces;

(iii) el necton: cefalópodos, crustáceos, peces y mamíferos.

El mar territorial del Perú "exhibe una ictiofauna notablemente rica en su composición especiológica", pero hasta el momento se han identificado en el litoral alrededor de 700 especies de peces.

Las estadísticas en el Perú casi siempre han hecho preferente referencia al volumen de la captura orientada hacia la producción industrial de harina y aceite de pescado; por ello, sin pretender reproducir una curva histórica desde épocas remotas, mencionaremos algunas cifras, para dar una idea de cómo se ha venido manejando el recurso pesquero.

Así tenemos que, cuando en 1939 se pescaba la anchoveta para consumo humano directo, apenas se llegó a 11 toneladas de captura. En 1950, cuando se da inicio a la producción industrial de harina de pescado, basado en la reducción de anchoveta, se logra el procesado de 3 742 toneladas de harina, en proporción 5:1.

En el año 1970 se estableció un record mundial de captura, en apenas 50 millas, alcanzando más de 12,5 millones de toneladas, de las cuales la captura de anchoveta constituyó el 98,4% (12 276 977 t), con una producción de harina igual a 2 253 439 t.

En los años subsiguientes y como consecuencia de la agresiva depredación del mar nacional, la industria de la harina ingresa a una insostenible crisis, por lo que las autoridades proceden a autorizar la pesca de especies consideradas de mesa, para suplir la ausencia de la anchoveta en la producción de harina y aceite de pescado; no se ha logrado superar tan difícil situación hasta la fecha, ni tampoco se ha recuperado totalmente el stock disponible de la anchoveta; sin embargo, algunos voceros oficiales del sector pesquero, se aprestan a manifestar que en 1982 se cumplirán las metas de captura propuestas y que se logrará una captura cercana a los 4 millones de toneladas, de las cuales la anchoveta puede significar el 25% de la captura.

Frente al grave riesgo que representa la pesca indiscriminada dirigida principalmente a la consecución de divisas, para mejorar la balanza de pagos, se escucha el reclamo del Director General Científico del Instituto del Mar del Perú, Dr Felipe Ancieta C., cuando en un artículo periodístico escrito recientemente, llama la atención "sobre la necesidad de revisar y reorientar las acciones de política ..."

La fauna aviar de la corriente costera peruana está constituida principalmente por las especies productoras de guano de islas, producto que llegó a tener gran significancia en la economía del país. "Entre las aves migratorias y residentes se han registrado alrededor de noventa especies", cuya población que sobrepasó los 20 millones en 1956, sufrió una gran merma debido a la mortandad catastrófica causada por las alteraciones ecológicas, a su vez provocadas por los transtornos hidroclimáticos "que se suceden con frecuencia dentro del ámbito de la corriente costera del Perú".

También contribuyó negativamente en la estabilidad de la población aviar, la pesca excesiva de la anchoveta, principal alimento de las guaneras que inciden grandemente en el ciclo biológico oceánico.

Con las medidas de protección a las aves que han asumido las autoridades y la racionalización y control en la pesca de la anchoveta, y, en tanto no se produzcan nuevos transtornos hidroclimáticos, esperamos que se recupere la población de aves guaneras, de modo que el país nuevamente obtenga los beneficios de tan generoso recurso.

3.2 Recursos Continentales

En la superficie del territorio continental, que abarca una extensión de 1 285 215,60 km^2, se da la presencia de más de 4 000 espejos de agua, conformados por los lagos, lagunas y ríos interandinos, como también por las lagunas, "cochas" y ríos de la amazonía.

La superficie continental del territorio peruano, comprende en realidad tres cuencas: (i) la del Pacífico (ríos que nacen en la sierra y además, toda la orilla costera que incluye esteros y zonas de filtración permanente); (ii) la del Atlántico o Amazonía (que incluye a todos los ríos y lagunas interandinas y de la selva alta y baja); y, (iii) la del Titicaca o Altiplano.

Se recuerda que desde fines de la década del 30, y más intensamente en la década del 40 y hasta la del 50, se establecen programas de sembrío en los espejos interandinos, con la finalidad de ofrecer al poblador una nueva alternativa de alimentación, con la pesca en ríos y lagunas de las truchas que lograron aclimatarse hasta conseguir su autoalimentación en estos lugares. Lamentablemente, por un lado la ignorancia y descontrol de este tipo de pesca, hicieron mella en las poblaciones truchícolas que eran explotadas hasta por medios vedados, y por otro lado la decisión de los posteriores dirigentes estatales, que prefirieron el establecimiento de instalaciones para la pesca intensiva (piscigranjas).

La truchicultura intensiva aleja el producto de la mesa popular debido a que el mercado exterior ofrece mejor precio, que así compensa mejor el alto costo de producción. Esta pesquería, que aparece con más evidencia a partir de la década del 70, sin ninguna planificación previa y olvidando mantener y promover la pesquería de especies nativas, llega a provocar problemas con las poblaciones locales, dado a que los responsables del mantenimiento de las piscigranjas, recurren a artificios para conseguir los alimentos en el mercado popular.

La trucha llega a competir con el poblador andino en cuanto ambos requieren del maíz y de las visceras del ganado para su alimentación; la alimentación en las piscigranjas se basa en la preparación de pelets compuestos por harina de pescado, hígado de ganado y maíz molido, todos estos alimentos que también consume directamente el campesino, excepción hecha de la harina de pescado.

Sin previo estudio limnológico de los recursos hídricos, se están promoviendo incluso programas de truchicultura en la región del altiplano, con riesgo de hacerlos fracasar y con ello frustrar futuros proyectos cuando se planifique correctamente.

Dada las condiciones que estableció la industria harinera en el Perú, se ha descuidado demasiado la "pesca continental" o "acuicultura", a la que se le ha considerado equivocadamente importante; sin embargo, la extracción del recurso continental seguramente excede las 100 000 t al año, y existen algunas comunidades nativas en la amazonía cuyo consumo *per caput* sólo es comparable al de los países más desarrollados y consumidores de pescado en el mundo, como Japón, por ejemplo.

En las orillas de la costa oceánica, rica en nutrientes y de fabulosa actividad biológica, se pueden establecer innúmeros asentamientos poblacionales de carácter pesquero, basados exclusivamente en el cultivo de peces, mariscos y moluscos, y algas. Se puede repoblar los ríos de la costa de aguas permanentes, con especies nativas o híbridas apropiadas para la región; así, con una planificación adecuada, tanto en la sierra, como en la selva alta y baja, se puede obtener una gran producción que permita el autoabastecimiento de las poblaciones allí posesionadas.

3.3 Medio Ambiente

Ya se está haciendo común en el litoral marítimo ver las playas cercanas a los centros poblados, con gran índice de contaminación, debido a la falta de control en los efluentes de deshechos urbanos (aguas servidas) y desagües industriales. Peor sucede en los puertos donde existe intensa actividad minera, como en la zona cuprífera del sur, que ha producido mortandad de los seres vivos que habitan la costanera.

En la Sierra, donde es mayor la actividad minera, es raro encontrar un curso de agua que no esté contaminado por los relaves mineros, porque aunque existe legislación que prohibe al minero vaciar estos relaves a los ríos y lagunas, la falta de control por parte de las autoridades o la falta de energía de las mismas, permite que se prosiga contaminando el potencial hídrico, que bien podría servir para incrementar el potencial de recursos hidrobiológicos en esta región.

También se debe considerar en este capítulo el peligro que significa para la pesquería continental el empleo indiscriminado de insecticidas, pesticidas, hierbicidas y otros agentes empleados en la actividad agropecuaria, pero que sin embargo surgen como grandes contaminantes del medio ambiente, afectando el desarrollo de otras actividades como la pesquería.

Parece mentira en nuestro país, porque aún no se le ha asignado mayor importancia, debido a que somos un país con grandes espacios abiertos, pero la exhalación de los centros urbanos e industriales va afectando el microclima del medio circundante, incluso las fuentes de aguas, por lo que se hace necesario desde ya, que las autoridades e instituciones profesionales intervengan para establecer los organismos pertinentes, que velen por el medio ambiente sano y limpio, para el bienestar de la población.

No existe pués, en el Perú, ningún organismo específico que se refiera al control del medio ambiente, sino que más bien, por ser muy nueva esta inquietud en los países en desarrollo, las autoridades creen que es suficiente con el control sanitario que ejerce jurisdicción el Ministerio de Salud Pública.

En la amazonía existe una contradicción permanente entre los que se proponen sacar el mayor provecho económico con la explotación forestal, y, los que se adelantan a advertir que la tala indiscriminada de los bosques significa no solamente el riesgo de quedar sin tierras productivas y posiblemente expuestas a la erosión, sino también, porque ello conllevará irremediablemente a un cambio imprevisible del microclima, con los consiguientes resultados negativos para la República.

4. LA PESCA ARTESANAL

Los asentamientos de pescadores artesanales distribuidos a lo extenso del litoral marino del Perú se caracterizan por ser pequeños poblados urbanos, donde casi siempre están ausentes los servicios urbanos, cuando no en forma primaria. Sus viviendas construidas por los mismos pescadores y sus familiares, muestran hasta ahora el estado de abandono en que los tienen las autoridades.

Algunos lugares se vieron afectados por la presencia de los industriales, ávidos de un fácil y rápido enriquecimiento con la producción de harina y aceite de pescado. Entonces no sólo fueron poluidas las playas con los desechos procedentes de estas nuevas instalaciones, sino que incluso fueron desplazados por el violento crecimiento de las edificaciones fabriles y sus necesidades defrente de playa, para la rápida descarga de la anchoveta.

Cuando se creó el Ministerio de Pesquería, se ofreció a los pescadores artesanales resolver sus problemas más inmediatos, proponiéndoles instalaciones que les permitan facilitar la descarga de sus productos, así como también, edificaciones con cámaras frigoríficas para conservar los excedentes de la pesca y evitar así su deterioro. Dentro de estas instalaciones se realizaría la primera etapa de la comercialización de los productos hidrobiológicos, con lo cual se les aseguraría un precio de refugio, y evitar el abuso que siempre han cometido con los pescadores, los intermediarios.

Es cierto que se construyeron 8 terminales pesqueros zonales, en igual número de caletas de pescadores artesanales; pero, lamentablemente, la administración de los mismos fue desplazando poco a poco a los poseedores de pequeñas embarcaciones, que son los más, y seleccionando cierto tipo de especies más rentables, por lo que nuevamente se vieron frustrados los ofrecimientos y por consiguiente, aún siguen en las mismas condiciones, a pesar de haber transcurrido más de un decenio de la intervención oficial.

Nuevamente ahora, con la nueva Ley de Pesquería, que señala como primera prioridad la pesca para el consumo humano directo, se está proponiendo la construcción de nuevas facilidades en favor de los pescadores artesanales, con el aporte de un crédito facilitado por el Banco Interamericano de Desarrollo para tal fin.

Si tenemos en cuenta, que la pesca artesanal siempre ha sido la que se aprovechó para el abastecimiento de las poblaciones urbanas de la costa y sierra del Perú, entonces será de mucho provecho este nuevo programa de realizaciones en su beneficio.

De acuerdo con las más recientes manifestaciones del titular de la cartera de pesquería, el consumo *per caput* nacional alcanza a 13 kg; y, siendo estimada la población peruana en cerca de 18 millones de habitantes, entonces tenemos un consumo nacional equivalente a 234 millones de kg por año o sea, 234 000 t. Bueno pués, si proyectamos los datos estadísticos de la producción de la pesca artesanal, basados en el Anuario Estadístico Pesquero (del año 1979, el más reciente), obtendremos una cifra cercana a las 200 000 t. Esto a simple vista parece muy extraño, pero no tanto si consideramos que el poblador peruano tiene aún un hábito de consumo que coincide con las especies hidrobiológicas que ofrece el pescador artesanal desde tiempos muy remotos. Cuando se ha querido introducir las especies marinas al estado congelado, se ha producido mucha resistencia de parte del consumidor, tan es así, que incluso se establecieron vedas en el consumo de otras carnes diferentes a las de la pesca, para obligar a la población a consumir más productos marinos, incluyendo la oferta al estado congelado; pero, una vez que se abrió nuevamente el mercado a la libre oferta, entonces se retornó también al hábito tradicional de los productos al estado "fresco".

La economía del pescador artesanal es muy precaria, y si hiciéramos algunos cálculos muy rápidos en base a las cifras expuestas anteriormente, obtendríamos por ejemplo, que las 200 000 t producidas por cerca de 25 000 pescadores artesanales marítimos, a un valor promedio unitario de US$ 0,047 por kg (Per.Sol. 40,00/kg), significa un ingreso mensual equivalente a apenas US$ 31,37 por pescador; esta cifra, muy por debajo del salario mínimo en Lima (capital de la República), que representa algo más que US$ 70,00 (Per.Sol. 60 000,00 al cambio de Per.Sol. 850,00 por US$ 1,00).

La organización artesanal más común entre los pescadores es la Asociación de Auxilios Mutuos, que vela incluso por la familia cuando se produce el fallecimiento de alguno de sus miembros. Se ha pretendido introducir otras formas de organización en las caletas de pescadores artesanales, pero a excepción del cooperativismo, siempre se exponen al rechazo, debido a que propugnan el individualismo, el egoísmo, que está en contra de sus costumbres ancestrales.

El pescador artesanal, al llegar a la playa al cabo de la faena de pesca, lo primero que hace es repartir el producto entre sus tripulantes, que generalmente son sus propios parientes, deja algo para sí y recién el resto lo entrega para la comercialización, esto último es lo único que ingresa en las estadísticas.

La actitud solidaria del pescador artesanal, lo predispone como ejemplo para establecer un programa bien planificado de nuevos asentamientos costeros, que se dediquen a la pesca selectiva con pequeñas embarcaciones. También se puede conseguir, con un plan bien estructurado, mejorar las condiciones de vida de estas comunidades pesqueras, empezando por proporcionarles facilidades urbanas, incluyendo la capacitación y los servicios asistenciales de salud, recreación y préstamo de capitales con asistencia técnica. Hasta la fecha, no se ha establecido un programa serio para la pesca artesanal.

5. LA COOPERACION TECNICA

La pesca en el Perú, definitivamente, siempre ha sido una pesca de exportación, por lo menos esto viene sucediendo desde hace tres décadas; y si no, basta apreciar las cifras de la captura anual en la zona marítima y compararlas con la que corresponde al consumo interno, para llegar a esta conclusión.

Para demostrar esta afirmación, vamos a plantear la siguiente hipótesis: admitamos que se obtenga la meta planteada por el Gobierno, la cual es de duplicar el consumo *per caput* de pescado al finalizar su período (esto es, para mediados de 1985), y que además, para esa fecha, la población del Perú alcance los 25 millones de habitantes; entonces, el volumen de consumo interno de productos hidrobiológicos alcanzaría a 625 000 t.

Si además, tomamos como inamovible la cifra que corresponde a la meta de captura propuesta para el año 1982, que equivale a 4 millones de toneladas, entonces obtendremos restando la cifra del consumo interno para 1985, un excedente que equivale a 3 375 000 t. Lo que significa, que en el mejor de los casos, el consumo interno en el Perú sólo alcanzaría a ser el 18,52% del volumen total de pesca.

Por consiguiente, tenemos que convenir que, siendo la mayor producción pesquera peruana dedicada para la exportación, entonces, debemos aplicar tecnologías apropiadas para competir en el mercado internacional, que es cada vez más exigente en cuanto a la calidad y presentación de los productos de consumo humano directo. Que depende del mercado al que se va a exportar, para cumplir con los requisitos mínimos de aquel.

Para lograr este objetivo, no sólo debemos actuar en el sentido de conseguir instalaciones modernas y eficientes, sino también personal técnico capaz de conseguir el producto deseado. Esto, conlleva un conocimiento no sólo de las técnicas y de mercadeo, sino también exige una mejor preparación para los niveles administrativos y de decisión en las empresas y organismos del Estado, que tienen relación con la actividad pesquera, desde los primeros pasos que significa la captura de las especies, su selección y conservación, su procesamiento, distribución, almacenamiento, empaque y comercialización, incluso la modalidad de embarque, según destino.

Hay pués, entonces, que lograr una importante capacitación de los recursos humanos, simultáneamente con la aplicación de la tecnología y equipamiento más apropiados.

La cooperación técnica juega entonces un papel muy importante en países como el Perú, que cuentan con suficientes recursos para abastecer su propio mercado y cuyos excedentes, que son el mayor volumen, servirán para transferirlos para beneficio de otros pueblos.

En el Perú se han dado programas de cooperación técnica de diferentes modalidades; desde los programas de capacitación a funcionarios y profesionales del Gobierno, en diferentes instituciones públicas y privadas de los países de mayor experiencia pesquera,

pasando por la presencia de misiones de expertos de la FAO, y de diferentes países, dirigidas a conseguir el mejor asesoramiento en el diseño, edificación y equipamiento de los proyectos estatales; pero, lo que no se pudo obtener es el asesoramiento en la puesta en marcha de estos proyectos, por lo que muchos de ellos no cumplieron cabalmente con los fines para los que fueron propuestos.

Faltó cerrar el ciclo. Pero además, y tal vez por la presión política de los gobernantes, las sugerencias de los expertos internacionales nunca fueron totalmente aceptadas o escuchadas, ejemplo de ello lo tenemos en lo referente a los esfuerzos de pesca aplicados a determinadas especies, como la anchoveta y la sardina. Igual sucede con la opinión de los expertos nacionales, porque cuando no coincide con las pretensiones de los políticos encargados del sector pesquero, hacen caso omiso de las sugerencias y hasta se llega al extremo de despedirlos de la función pública.

5.1 Formación de Expertos Nacionales

A través de los programas de cooperación técnica, se logró en el país la especialización de un grupo bastante importante de profesionales, en los diferentes aspectos de la actividad pesquera: ingenieros hidráulicos, ingenieros estructurales, ingenieros civiles especializados en edificaciones portuarias, arquitectos para el diseño de instalaciones portuarias y de refrigeración, planificadores industriales pesqueros, ingenieros pesqueros, economistas e incluso abogados que se especializaron en la legislación internacional relacionada con la pesca y el mercado.

Todo ello, luego de más de 12 años de transcurrido el período de existencia de la pesquería oficial. Pero lo grave del asunto es que de estas decenas de profesionales, que gozaron de becas de especialización, y, que obtuvieron experiencia dentro y fuera del país en esta nueva disciplina, y que para muchos significó un verdadero post-grado en su formación profesional, de este grupo, quedan apenas unos cuantos trabajando en la administración de la pesquería nacional. Debido a los vaivenes de la política peruana, cada vez que se cambia a un ministro, hay una muda casi total de los funcionarios que tienen el nivel de decisión, y en estos cambios también se incluyen a los especialistas y técnicos de alta calificación; infelizmente, la actitud que se ha agravado recientemente con la decisión del partido de Gobierno, al considerar que todos los niveles de responsabilidad en la Administración Pública, deberán ser ocupados por sus correligionarios.

5.2 Cooperación y Dependencia

La decisión de escoger cuál de los programas de asistencia técnica es más conveniente para el país o para un sector específico, es de responsabilidad de los funcionarios y dirigentes del país o del sector. Por ello, se debe tener mucho cuidado con aquellos ofrecimientos de empresas e incluso instituciones de algunos países, que disfrazan la venta de determinada tecnología o que, desean controlar la producción de determinada línea, a través de la asistencia técnica. Se confunde esta actitud con aquellos créditos atados que se ofrecen en el mercado internacional de capitales.

Las instituciones de capacitación e investigación son más expuestas a este tipo de actitudes porque en el afán de conseguir ayuda en equipos y becas hacia el exterior, aceptan condiciones que a veces lesionan la soberanía institucional; y, lo que es peor, con la complicidad de la ignorancia o debilidad de funcionarios que aceptaron el cargo por ser relacionados con las autoridades de turno.

Si la capacitación y la investigación no va a repercutir en logros, que signifiquen un mejor nivel de alimentación de la población local, una más racional y mejor utilización de los recursos, sino que beneficia más directamente al país de donde proceden los expertos, entonces se está desnaturalizando esta honorable misión que significa la cooperación técnica.

5.3 Cooperación Técnica entre Países en Desarrollo

Aún cuando 12 años no es mucho tiempo para señalar a un país como de gran experiencia en un campo específico, es el caso que en tan corto tiempo el Perú ha adquirido muchas y provechosas experiencias en diferentes aspectos de la actividad pesquera, que otros países

pueden aprovechar. Pero, además, los peruanos debemos también buscar la cooperación horizontal con países del continente especialmente, porque todavía nos falta mucho que aprender, esencialmente en el área de la acuicultura.

La elaboración de proyectos de inversión pesquera, la planificación industrial, los proyectos de terminales y frigoríficos pesqueros, plantas de producción de harina y aceite de pescado, plantas de agua de cola, centros de capacitación de mandos medios para la pesca y la industria, instituciones de investigación tecnológica, investigación científica y biología marítima, manipuleo, almacenamiento y procesos de transformación no sólo para envasados tradicionales, y otros, son los campos en que se ha experimentado ya en el Perú, que sirve de aporte a la humanidad.

6. POTENCIAL PARA UNA ESTRATEGIA NACIONAL

Empezaremos diciendo que se intentó abarcar todo el horizonte de la actividad pesquera con mucha improvización y continuos ensayos, y que todavía se persiste en ellos, por falta de una verdadera política pesquera; que a pesar de no tener una flota pesquera nacional racionalmente establecida y diseñada para nuestro tipo de pesca, de no tener planificada la industria pesquera integral con el aporte y participación armónica del Estado y la iniciativa privada, en sus diferentes modalidades de expresión. La pesquería peruana, podríamos asegurar, aún no ha sido tomada seriamente.

La gran depredación de algunas especies, con la complicidad de los cíclicos transtornos bioclimáticos, no han significado, estoy seguro, una catástrofe mortal para la pesquería en esta parte de la región oceánica. De las más de 700 especies identificadas en el mar frente al Perú, apenas el 10% se hallan bajo investigación biológica y de ellas tal vez sólo el 50% son especies empleadas en la alimentación popular; sin considerar que existe un gran potencial en los recursos de aguas continentales, para un gran desarrollo de la acuicultura.

Las aguas amazónicas tan sólo han sido exploradas para extraer una gran cantidad de peces ornamentales, sin embargo existen muchas especies aún desconocidas por los técnicos más sí por los nativos, y que pueden aplicarse a la alimentación de la creciente población de colonizadores.

En cuanto al aporte humano aplicado a la actividad pesquera, en el país existen varios programas universitarios de formación profesional en el campo de la pesquería, que cada vez amplían su especialización a nuevas áreas de la actividad. También, en el Ministerio de Pesquería existe concluido un Estudio Integral para establecer un programa sistematizado a nivel nacional para la capacitación de los mandos medios que deberán participar complementados con los profesionales universitarios e investigadores, en todo el ámbito de la pesquería: mantenimiento de máquinas y motores de navegación y estacionarios; navegantes y tripulantes, especialistas en manipuleo, refrigeración y procesamiento; en transporte de productos terminados y almacenamiento de los mismos; electricistas y técnicos en comunicación, etc.

Existe un Instituto de Investigación Científica del Mar y Aguas Continentales (Instituto del Mar del Perú) y un Instituto Tecnológico Pesquero (ITP).

En fin, el Perú tiene un potencial extraordinario para su desarrollo y para la cooperación con otros países, de modo de conseguir enfrentar al flagelo que se cierne sobre la humanidad: EL HAMBRE.

Una política certera para la pesquería peruana deberá tomar en cuenta que lo que se requiere es el establecimiento de programas de inversión que considere primordialmente el empleo intensivo de la mano de obra, en múltiples proyectos de pesca artesanal, porque cuando se concentra demasiado capital en un solo proyecto, éste exige la aplicación de técnicas sofisticadas en desmedro de la mano de obra masiva. Con ello se conseguiría una mejor redistribución de la riqueza, se conseguiría también desconcentrar a la población urbana que hoy está ahogándose en los grandes centros urbanos de la costa, trayendo consigo innumerables problemas municipales de abastecimiento y circulación.

La costa oceánica del Perú es bastante extensa y puede dar oportunidad para establecer colonias de pescadores que se dediquen a la pesca costera, así como a la maricultura, para el abastecimiento de la población nacional con productos hidrobiológicos, y porque no también, con productos elaborados para la exportación.

Se ha abandonado algunas técnicas que han sido tradicionales, especialmente en el norte del país, y que se aplicaron para la obtención de productos deshidratados (salpresos y secosalados), seguramente que con el mejoramiento de las embarcaciones, facilidades para el desembarco, para el almacenamiento y conservación y con el perfeccionamiento de las técnicas de procesamiento, se va a recuperar la capacidad productiva de este tipo de pesquerías.

Debe pués, darse mayor importancia a la pesca artesanal y a la formación de pequeños establecimeintos de crianza y producción en las aguas continentales para lograr así el autoabastecimiento de las poblaciones andinas.

El Gobierno nacional tiene por delante un tremendo reto para garantizar a la población del país el incremento de su consumo de proteínas de procedencia animal, realizando grandes campañas para mejorar los hábitos alimentarios, de modo de evitar la cada vez mayor dependencia de la importación de alimentos, con lo cual se produciría a la vez una mayor economía, y como consecuencia, aplicar estos dineros en mejorar las condiciones de vida del poblador peruano.

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THE PAST AND PRESENT PROBLEMS OF DEEP-SEA FISHERIES IN POLAND CASE STUDY

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ABSTRACT

The paper is concerned with the main problems of the Polish deep-sea fishery. The said fishery constituted about 70 percent of the total sea fishery catches, while the remaining part came from the Baltic Sea. The analysis covers the years 1960-81, focusing on two characteristic periods. The first years (1960-75) is called in this paper the past period. It was characterized by free access to most of the fishing grounds off the shelf. The second period, which started in the mid-seventies and continues to the present day, is characterized by a considerable decline in the conditions of operation of the Polish deep-sea fishery and its economic effects. This comes as a result of limited access to off-shelf fishing grounds caused by the introduction of national fishery zones and also the fuel crisis. While, during the past period, the development of deep-sea fishery was stimulated almost entirely by internal factors (a constantly increasing demand for fish, the existing on-land infrastructure, a developing processing technology and the ability to construct food fishing vessels in local shipyards), in the development of fisheries in the present period the determining factors were mainly external: international, legal and economic. The above mentioned changes influenced the profitability of deep-sea fisheries and a decline was noted in the competitiveness of fish protein production as compared with animal protein production. Up to 1975, the production costs of 1 kg of fish protein were considerably less than protein production from meat, poultry and eggs and higher than protein production from dairy products. In the years that followed, this situation changed so that it was no longer favourable for the fisheries. As a result, in 1980, fish protein became more expensive, not only than protein obtained from dairy products, but also more expensive than protein obtained from poultry and eggs. Only in comparison with meat did these costs remain in favour of the fisheries, but the difference had considerably decreased. It can be stated, therefore, that at present, deep-sea fisheries in Poland ceased to be a source of cheap food.

The actual forecasts up to 1990 for Polish deep-sea fisheries fix the catches on the level of 350 000-450 000 t/year, thus being considerably lower from those obtained in the previous years (1975 - 603 000 t, 1980 - 560 000 t). It is assumed that there will be an increase in fishery activities in open waters, as well as attempts to intensify activities to obtain the possibility to fish off the shelf mainly through various types of cooperation. The undertaking of exploitation of the Antarctic krill resources on an industrial scale, is also being considered.

The concluding paragraph presents the experiences of Poland that can be used in the strategies for world fisheries developing being at present worked out and for technical cooperation of countries.

1. INTRODUCTION

The aim of the development of fisheries in Poland was and still is the supplementing of insufficient agricultural production by supplying the market with protein products of sea origin. These have been delivered from the Baltic Sea fisheries and deep-sea fisheries in other waters, mainly the Atlantic and Pacific. The fundamental role in this field was played by deep-sea fisheries[1/] (about 70 percent of catches in total) as a result of limited catch feasibilities in the Baltic Sea. The biological productivity of the latter allows the maximum annual catch to amount to about 900 000 t and the Polish share of this amounts to 200 000 t.

The effect of reaching this aim of the Polish fishery was a considerable increase in the volume of catches. In the period of time from 1960 to 1980, catches increased from 168 000 to 782 000 t live weight - more than 4.5 times. The deep-sea catch increase was much more rapid than that in the Baltic Sea (6.5 times and 2.5 times, respectively). The development in catches caused, in consequence, an increase in the local market fish supply, this, in turn, being reflected by a rise in the consumption of fish products from 4.2 to 7.6 kg *per caput*. A part of the products was exported, mainly directly from the vessels to coastal States, in order to cover the costs in foreign currency of the fleet, to improve economic catch effectiveness and to obtain foreign currency to import fish popular on the local market (e.g., herring, carp). The development in fish catches contributed also to the rise in employment in the Baltic and deep-sea fishing enterprises, as well as in the vertically integrated industries (canning enterprises) and in specialized wholesale and retail enterprises located on the coast and inside the country. In 1980, 47 100 people were employed in all of these enterprises - of which 17 500 were fishermen employed directly on deep-sea fishing and factory trawlers and on the Baltic fishing boats. Officer staff training is being carried out in two higher maritime schools in Szczecin and Gdynia and in the Agricultural Academy in Szczecin (processing technologists). Specialized professional education giving qualifications to work on boats and on shore has also been developed. Also, 750 people are employed in scientific work for fisheries. Basic figures characterizing the Polish fishery in the years 1960-81 are presented in Table 1. Figures for deep-sea fishery are shown separately in the Table.

It should be noted, in addition to the presented characteristics of Polish fishery, that three sectors of the means of production are engaged here: Government-owned enterprises, fishing cooperatives and individual fishing boat operators. All the aforesaid are engaged in Baltic fishery and only Government-owned enterprises participate in deep-sea catches.

The introduction of economic zones during the mid-seventies had a different impact on the Polish Baltic fishery than it had on the deep-sea fishery. The introduction, in 1978, of an Exclusive Economic Zone in the Baltic Sea, guaranteed a relatively stable catch level of around 200 000 t annually and presented a possibility of rational economic management of the available resources. On the other hand, in deep-sea fishery, the possibilities of free access to fishing grounds and fish species that Poland was interested in, had become considerably limited. The outcome of this was a decline in the results obtained in comparison to the period prior to the introduction of fishery zones. The aim of this paper is to present and assess the fate and changes in deep-sea fishery during the past 20 years.

Firstly, the characteristics of the past developments in deep-sea fisheries has been presented, i.e., in the time of free access to most fishing grounds of the shelf (years 1960-75) and of the present, when we have to cope with limited access to fishing grounds and fuel crisis (years 1976-81). As from 1976, a deterioration has been noted in the conditions of Polish deep-sea fishery activities and the economic effects of this. It has entered into a new phase of development, completely different from the previous one, when it was stimulated almost entirely by local factors, such as: a constantly increasing demand for fish, the expansion of processing plants and processing technology and a

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1/ Deep-sea fisheries shall be used in this paper as meaning fishing activities outside the Baltic Sea

Table 1

Basic figures characterizing the Polish fishing industry in the years 1960-81

Specification	1960	1965	1970	1975	1980	1981
I. The Fishing Industry in Total (Baltic and Deep-Sea)						
1. Fleet[a/]						
- no. of vessels	664	676	698	636	641	638
- tonnage in '000 GRT	89.0	163.7	247.5	287.4	337.0	317.4
- engine power in '000 hp	144.8	222.6	300.1	391.4	498.1	483.5
2. Catches in '000 t (live weight)	168.3	280.1	451.3	816.7	781.7	632.5
3. Local market supply in '000 t (final products)	124.8	146.8	187.9	223.7	273.3	245.2
4. Export in '000 t	5.2	27.0	56.9	87.6	72.4	76.6
5. Import in '000 t						
- consumer products	31.4	21.0	14.6	54.5	28.7	67.7
- fish meal	6.4	60.0	125.9	139.2	76.3	24.2
6. Consumption in kg *per caput*	4.2	4.6	5.9	6.6	7.6	6.8
7. Labour force in '000[b/]	26.6	31.1	38.9	44.5	47.1	46.9
sea fishermen	8.4	10.3	14.0	15.7	17.5	17.5
II. Deep-Sea Fisheries						
1. Fishing fleet						
- no. of vessels	117	139	149	130	116	103
- tonnage in '000 GRT	51.1	120.7	182.5	201.6	232.4	203.7
- engine power in '000 hp	72.3	140.8	201.5	250.0	298.5	270.1
2. Auxiliary fleet						
- no. of vessels	3	4	4	8	10	11
- tonnage in '000 GRT	18.0	18.0	39.2	58.3	71.3	79.6
- engine power in '000 hp	12.2	13.0	24.8	56.1	75.3	84.9
3. Catches in '000 t (live weight)	85.5	195.5	304.6	603.1	560.0	423.5
in joint ventures	-	-	-	39.3	160.5	34.8
4. Labour force in '000	7.2	12.7	15.3	17.9	19.6	19.4
sea fishermen	3.2	5.6	8.5	10.5	11.9	11.8

a/ Excluding motorized and non-motorized boats
b/ Includes those employed in fishing, processing and trade enterprises

considerable increase of the Polish ship-building industry's capacities. Since the mid-seventies, mainly external international and economic factors started to decide about the development of deep-sea fishery.

In the next part of the paper, the past and present phase of deep-sea fishery policies, the implementation of goals and Government programmes of activity and the results of these have been placed under assessment. Following this, the anticipated activities of

the Polish fishing industry have been presented and also, our country's experience, which could be proved useful in international cooperation and in the strategies of world fishery development, being prepared at present.

2. POLISH DEEP-SEA FISHERY DURING THE PERIOD OF FREE ACCESS TO FISHING GROUNDS (YEARS 1960-75)

Since 1960, the Polish deep-sea fishery commenced on the exploitation of the so-called fishing factory trawlers, i.e., processing and freezing trawlers. This was a major technological improvement in comparison with the existing fleet of conventional steam side trawlers and drifters that were not able to process catches, except for storing salted fish in barrels. The said conventional fleet was used for fishing in the North Sea, while fishing factory trawlers made it possible for the Polish fishing industry to increase the volume of catches in more distant fishing grounds. In the years 1960-75, 10 different series of varying types of fishing factory trawlers had been built in Poland of 61-90 m in length, capacity of 800-2 700 GRT, main engine power of 1 375-3 600 hp and freezing capacity 5-60 t/24 h. The new-type trawler fleet was being developed at a very speedy rate: in 1960 - 1 vessel; in 1965 - 29 vessels; in 1970 - 57 vessels; and in 1975 - 81 vessels. The annual processing capacity on board these trawlers amounted approximately to: in 1960 - 8 000 t; in 1965 - 220 000 t; in 1970 - 480 000 t, and in 1975 - 690 000 t. The intense development of the fleet of fishing factory trawlers increased the average capacity of one fishing vessel in the Polish fishing industry from 436 GRT in 1960 to 1 551 GRT in 1975. It should be added here, that the developed fleet was one-sided as to the fishing technology and depended exclusively on bottom trawl fishing.

During the same period of time, in order to service the fishing fleet when working on the ocean fishing grounds with the unloading at sea, the supplying of the fleet with fuel, food, water, packing materials, etc., and also with repairs - two large mother vessels were placed under exploitation of 13 875 GRT capacity each, three refrigerated fish carriers of 5 126 GRT capacity each, one refrigerated fish carrier of 1 733 GRT capacity and two smaller transportation vessels with non-freezing freight to transport salted fish in barrels and fish meal. The task of these auxiliary vessels was to increase catch capabilities of fishing vessels through extension of time of work on fishing grounds. It also allowed for an almost unlimited expansion of the radius of operation of the Polish deep-sea fishery.

The intense development of the deep-sea fishing fleet allowed for a considerable catch increase in different areas further and further away from mother ports (Table 2). The increase in distance to the fishing grounds resulted from the limited catch possibilities in closer fishing grounds. In 1960, fishing operations were practically being carried out only in the Northeast Atlantic (mainly in the North Sea). In the years that followed up to 1973, there were no fishing activities in fishing grounds further than 4 000 n mi. In 1975, already 200 000 t of catches, that is one third of the total deep-sea fishery catches came from fishing grounds placed further than 4 000 n mi away.

Following the expansion of the range of catches, considerable changes took place within the composition of fish species being caught (Table 3), such as: an increase in the variety of fish species being caught and a decrease in the fishing of species up till then traditionally accepted on the Polish market. Such were: herring, mackerel, cod, redfish and flatfish. In 1970 these species made up 86% of the total catches, while in 1975, the corresponding figure was 38%. At the same time, new species, such as hake and pollock, which in 1975 constituted 30% of the total catches, were easily introduced onto the local market. Thus, on the whole, changes of this period in the composition of fish species being caught did not result in a deterioration of the quality of the final fish supply.

The said changes, however, resulted in an incomplete utilization of processing appliances on board the vessels, which were adapted only for the processing of some fish species. These changes influenced also the introduction of new technologies in on-shore processing. As an example: the traditional depots and the standard packing means (barrels) were sufficient in the handling of salted fish, but an increase in supplies of frozen fish gave rise to the necessity of developing cold store chains and a development of the production capacity in the on-land processing (canning, the production of smoked fish and marinades).

Table 2

Polish deep-sea fishery catches in the years 1960-81 according to areas (in '000 t live weight)

Specification	1960	1965	1970	1975	1980	1981
1. Northeast Atlantic	85.2	114.7	57.0	120.0	13.9	6.6
2. Northwest Atlantic	0.3	56.5	216.4	187.6	4.6	9.7
3. Central East Atlantic	-	24.3	31.2	95.4	78.8	1.6
4. Southeast Atlantic	-	-	-	76.2	72.7	123.0
5. Southwest Atlantic	-	-	-	-	112.2	82.2
6. Northeast Pacific	-	-	-	84.6	116.8	165.6
7. Southeast Pacific	-	-	-	39.3	161.0	34.8
Total catches	85.5	195.5	304.6	603.1	560.0	423.5
The average distance from fishing grounds in n mi	800	1 700	2 800	4 300	6 400	7 300

Table 3

Composition of fish species being caught in the Polish deep-sea fishery in the years 1960-81 (in '000 t live weight)

Specification	1960	1965	1970	1975	1980	1981
1. herring	76.4	104.9	82.2	50.4	-	-
2. mackerel	6.9	6.3	76.6	100.7	4.3	5.6
3. flatfish[a/]	-	7.4	33.9	23.7	1.7	3.2
4. cod	1.9	25.0	57.9	28.1	2.4	1.5
5. hake	-	-	-	133.9	195.8	102.8
6. blue whiting	-	-	-	4.7	65.5	53.6
7. pollock	-	-	-	43.3	3.3	1.0
8. Alaska pollock	-	-	-	0.6	64.4	95.4
9. redfish	0.2	24.7	11.2	26.1	1.4	0.9
10. sardines, sardinellas	-	-	-	88.8	49.5	1.5
11. horse mackerel	-	-	9.3	40.6	97.2	120.1
12. Antarctic fish	-	-	-	-	33.4	12.4
13. squid	-	-	-	6.9	13.8	19.8
14. other	0.1	27.2	33.5	55.3	27.3	5.7

a/ Halibut, soles and other flatfish

Three Polish deep-sea fishing ports (Gdynia, Szczecin, Swinoujście) were constructed initially as home ports for fishing boats, drifter and side trawlers to take from them fresh and salted fish. Only from 1960 these ports turned into bases which mainly took away from the fishing factory trawlers the frozen fish. The aim of each port was a general development in order to be able to completely service all types of fishing vessels and cargos. Fishing ports remain under the authority of fishing enterprises. The most costly investments in the ports concerned with the infrastructure (harbour docks, quays) are being financed by the State budget. These ports are conveniently connected by road and rail with the main consumer centres inside the country. Table 4 shows the basic indicators characterizing deep-sea fishing ports.

Table 4

Basic indicators characterizing deep-sea fishing ports in the years 1970 and 1980

Specification	Year	Measurement	Gdynia	Swinoujście	Szczecin
Length of harbour docks in total	1970	m	1 537	1 220	1 820
	1980		2 107	2 423	1 820
Weight of unloaded final products in total	1970	t	95 700	98 070	49 768
	1980		135 000	161 120	142 000
Cold storage capacity	1970	t	5 000	4 000	-
	1980		5 000	25 744	11 000

3. THE POLISH DEEP-SEA FISHERY DURING THE PERIOD OF LIMITED ACCESS TO FISHING GROUNDS AND FUEL CRISIS (YEARS 1976-81)

The progressing tendency of introducing National Fishery Zones resulted in a decision taken in the mid-seventies to halt further development of deep-sea fishing fleet in Polish fishery, to avoid risk of overinvestment. However, earlier orders at local shipyards caused the entrance of new vessels to the fleet until the end of 1977. On the whole, the fishing fleet had increased by 23 large fishing factory trawlers of the capacity of about 2 700 GRT each. Simultaneously, in the years 1976-80, used up conventional steam trawlers were being successively withdrawn from exploitation. As a result of this, in 1980 deep-sea fishing fleet consisted of only fishing factory trawlers. The average capacity of one fishing vessel increased from 1 551 GRT in 1975 to 2 003 GRT in 1980. With regard to the auxiliary fleet, its development in the field of refrigerated fish carriers was not halted. Said vessels were needed, due to the still increasing distances to fishing grounds. Up to the end of 1981 four such vessels with a capacity of 7 800 GRT were added to the fleet.

In spite of a more difficult access to the resources, Polish deep-sea fishery catches continued in 1980 to stay close to the 1975 level (only in 1981 a marked drop was noted). This, however, was achieved at the cost of a still increasing distance to fishing grounds (Table 2) and further negative changes in the composition of fish species being caught (Table 3). The profitability of this fishing had also taken a clear turn for the worse. This was mainly an influence of external factors - a rapid increase in fuel costs and an increase in licence fees for the right to fish in alien zones. The effect these factors had on the economy of the Polish deep-sea fishery will be presented in Section 4 of this paper.

During the period 1976-80, Polish fisheries had clearly focused on fishing grounds further away than 4 000 n mi from the home ports. In comparison with 1975, fishing in the Northeast Pacific and joint venture fishing in the Southeast Pacific grew more intense. The exploitation of a new region of the Southwest Atlantic and Antarctic waters had also been undertaken. As a result of this, in 1980, 85% of the total Polish deep-sea fishing catches came from regions further away than 4 000 n mi, in comparison with 1975, when the respective figure was 33%.

Negative changes had taken place in the composition of fish species being caught. There had been an increase in catching of less valuable fish of smaller size, more difficult to process and, on the whole, not accepted by the consumer, such as blue whiting, horse mackerel, sardinella, anchovy, massbanker, capelin. In 1980 total catch of these less valuable fish amounted to 43% of total catch of all fish in deep-sea fishing. These species, which prior to 1975 were treated as material for fish meal, had become regarded as final consumer products. Existing technologies of processing high-quality fish had not proven applicable for these species and the end product was of poor quality, low taste and cuisine value. In general, new recipes have not yet led to satisfying results.

During the period discussed, in order to find new catch possibilities and secure full utilization of existing fleet, experiments in fishing had been conducted by the Polish deep-sea fishery in catches in the open sea outside National Fishery Zones. Above all, research work had been carried out in the Antarctic krill catch possibilities and its utilization. Due to the vast untapped potential of Antarctic krill, it had become the subject of interest of the Polish fishing industry in 1975-79. It was assumed that krill catches could become a new source of protein of sea origin, not only for Poland, but also for other countries. During four survey expeditions of research vessels and fishing factory trawlers, a considerable amount of information was collected on the biology of krill and its technological characteristics. The process of krill meat production was developed and in 1978-79 the first Polish peeling machine prototypes had been tested on board vessels. These machines were constructed to produce an end product of consumption similar to peeled shrimp tails. Among others, also the Leitram Company (USA) had cooperated in this task. The results of the research work showed also that industrial catches of krill in total for use in krill meal production that could already be undertaken by Poland, would not be worthwhile comparing with the international prices of fish meal at the time (Russek, Kasprzyk and Szostak, 1981). With regard to product consumption (krill meat), according to the Polish technology on Polish ships, its production could be profitable only when conducted from ports close to the Antarctic, e.g., the Falklands, South Georgia, etc. Conducting it from Poland would simply be too far away. Due to these reasons, exploitation of said resources was given up for the time being. Further research work focused on the improvement of krill processing technology for consumption and on the construction of appropriate machines and gears.

In spite of the present difficult period, the Polish fishing industry still plays an important role in the national economy. First and foremost, it supplements the food balance of the country, which is especially vital in a meat shortage situation. In 1980 consumption of fish protein in Poland constituted 5.5% of total consumption of all protein and 10% of animal protein. The fishing industry does not operate independently - it is an integral part of the economy connected with other branches through a series of mutual cooperative activities. Production and repair shipyards, plants producing specialized appliances, machines and instruments, the netting industry and others are all working for the fishing industry. Therefore, this industry is not only important for those employed in it directly, but also in an indirect way it stimulates the development of other branches of the national economy, supplying it with more work places. As the only field of the national economy, the fishing industry brings in additional material goods from outside the country. It should also be noted, that apart from consumption products, the fishing industry supplies the agricultural industry with fodder. In 1980, the supply of fish meal coming from the production of the Polish fishing industry, amounted to 72 000 t which satisfied over 30% of agriculture requirements.

4. ASSESSMENT OF PAST AND PRESENT POLICIES IN DEEP-SEA FISHING

Two of the periods under discussion: 'past' and 'present' (the dividing line here being the year 1975) differed not only in their aims for the fishing industry, but also in the possibilities and effects of attaining these aims. The policies of developing fisheries that had been worked out in the fifties and sixties, improved later in the years that followed and were consequently realized up to the beginning of the seventies. These policies, the basic aim of which was to increase the local consumption of fish were founded on the following assumptions:

- growing potential demand for fish;
- lower costs of fish protein production than animal protein production in agriculture;

- more favourable capital output ratio on investment in fisheries;
- free access to fishing grounds, and
- the existence of a strong ship-building industry, good harbour facilities and developed infrastructure.

Limited resources of fishing grounds in the Baltic Sea (those that were closest) resulted in the decision to give priority to the development of deep-sea fishery. The preferences of local consumers focused this development on catching and processing of two fish species, i.e., herring and cod (later on also the remaining white fish species). From the aim placed before the fishing industry, another priority also arose - supply of the local market and limited export.

The said priorities shaped the decision on the construction of specific types of fishing vessels adapted chiefly to the exploitation of fishing grounds placed 3 000 n mi away and more from the home ports. Bottom trawl fishing and processing of only particular fish species also characterized the types of vessels being constructed. As a result of, among others, the possession of a fairly homogeneous trawler fleet, there was a continuous increase in distance to the fishing grounds. On one hand, this was due to an over-utilization of traditional fishing grounds and on the other hand, the search for new fishing grounds of a specific structure of fish species' resources that could allow full use of the possessed processing machinery. Due to the increase in distance to fishing grounds, there arised the need to limit the negative effects of this and therefore resulted in the development of an auxiliary fleet, already mentioned. Such an exploitation system caused an extension in time length of the ship's stay at sea of up to one or even two years and the need to exchange crew by air transport.

In assessing the realization of the deep-sea fishery policies in 1960-75, taking into account also forecasts layed down in the sixties (Team work, 1967), it can be concluded that they had been almost fully realized (the forecast for the 1975 market supply planned it at the 240 000-t level, the actual figure was 224 000 t). Fish demand had also not declined, though in some cases (e.g., horse mackerel) periodical surplus on the market was noted. Until 1975, production increase was positive from the fundamental economic relations point of view, i.e., shaping of productivity of fixed assets, effectiveness of labour and other inputs. During the whole said period, productivity of fixed assets did not decline in sea fisheries. These tendencies were, at the time, more positive in fisheries than in agriculture and during this period the effectiveness of labour increased.

In 1960-73, though the distance to fishing grounds had increased, the cost of catching 1 kg of fish had risen only by 10.5%, thus the average annual cost increase in that period amounted to less than 1%. However, there was a distinct rise in this during 1974-75 and later on. In comparison with 1973, the unit cost increased by 35% in 1974 and by more than 45% in 1975. The conclusion can be drawn from this, that the main reason for the fishing unit cost increase was the increase in expenses and mainly that of fuel.

As from 1966, research has been conducted in Poland comparing the costs of obtaining protein in fisheries with the costs of production of it in the food industry (Team works lead by: Domagala, 1981; Niegolewski, 1970 and 1973). During the period 1966-75, the cost of producing 1 kg of fish protein was lower than the cost of producing meat, poultry and egg protein and higher than producing protein from dairy products. However, these relations did undergo changes. The dynamics of changes in the costs of protein production divided by separate groups of food products are presented in Table 5.

Up to 1973, the difference between fish protein production costs and meat protein production costs, in favour of the first, amounted annually on average to over 51%, and was maintained at a relatively stable level. In comparison with poultry, the corresponding figure was even higher. Since 1974, a marked tendency of rapid decrease in the difference between protein production figures was noted - no longer in favour of fish. Comparing with meat protein, fish protein was cheaper only by 30% in 1974 and 28% in 1975. In the case of poultry, due to an intense development of broiler production, the evening out of costs was even more rapid. The beginnings of these tendencies can be clearly seen in Figure 1. It can be concluded that, starting from 1975, the competitiveness of protein production in fishery in comparison with agriculture in Poland was in decline.

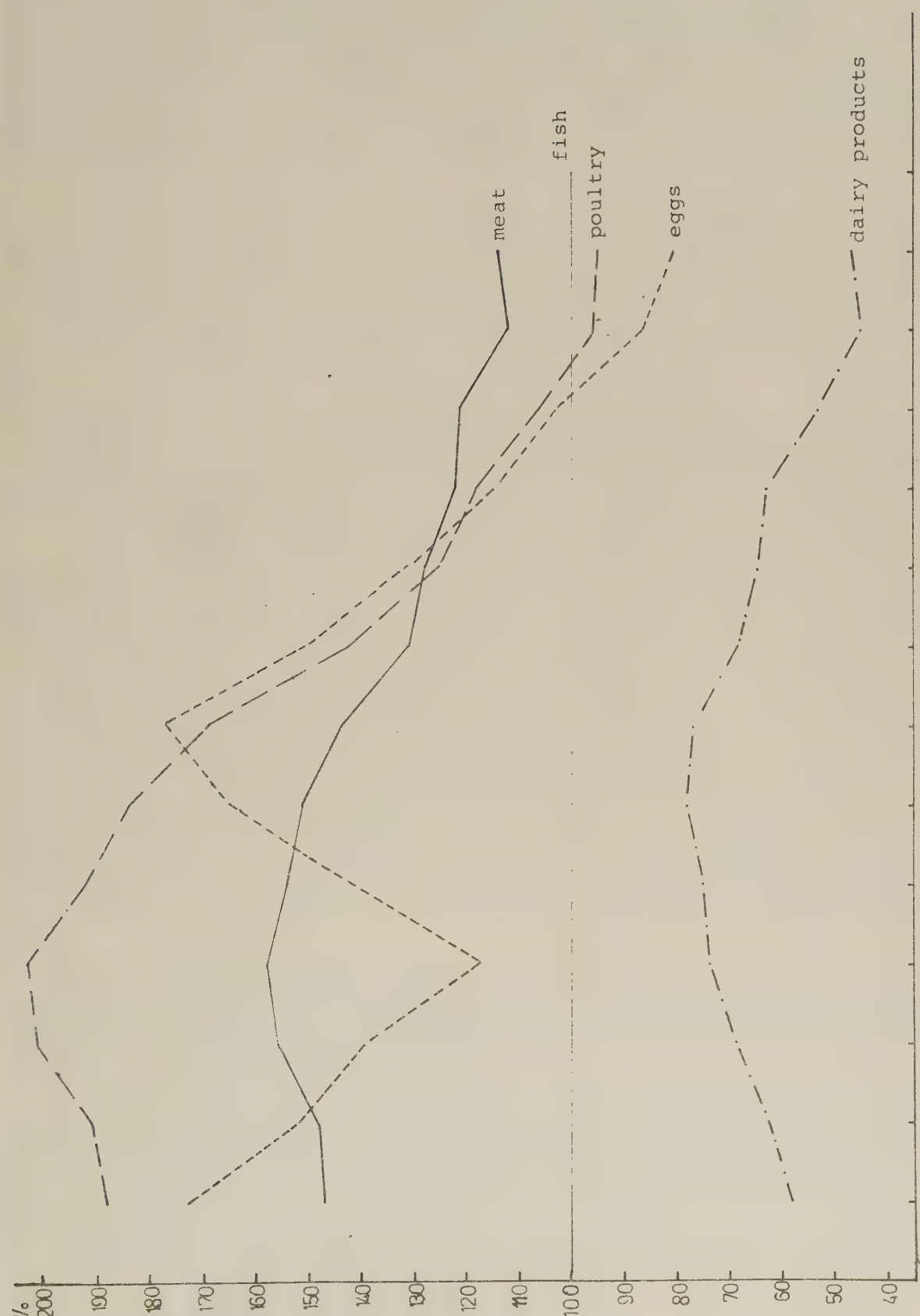

Figure 1 Indexes of the cost of animal protein production using fish protein production as a basis (fish protein = 100) (indexes drafted by using the three-year moving average method)

Table 5

Dynamics of increase in production costs of protein out of fish and other food products in Poland in the years 1966-80

Specification	1966	1970	1975	1980
Meat and meat products	100.0	104.4	144.8	264.3
Dairy products	100.0	121.6	185.9	292.7
Poultry	100.0	96.1	107.1	121.0
Eggs	100.0	66.0	129.9	162.0
Fish and fish products	100.0	101.8	211.0	354.8

In assessing the realization of deep-sea fishery policies in 1976-81, it can be said that the amount of catches in 1980 forecasted in the sixties (Team work, 1967) and in the early seventies (Team work lead by Polański, 1972; Team work, 1973) had been obtained. The expected figure was about 730 000-780 000 t, while the actual figure was 782 000 t. However, a change had taken place in the structure of catches, a change less advantageous from the point of view of local market need and more difficult in the utilization of consumption products. As a result of this, there had been a lower than expected market supply and consequently a lower consumption level *per caput* (7.6 kg comparing with 8.1 kg).

The forecasted catches had been realized, in spite of the introduction of fishery zones. The inevitability of the latter had already been assumed in forecasts made in the early seventies. It was expected though, at the time, that the new legal status of the fishing grounds would not so much effect the limitation of catches, but only their effectiveness. It was assumed that Polish fishery would be able to gain access to resources in other fishing zones by retaining the right to a certain amount of catches in traditionally exploited grounds on a 'historical basis'. Such access could also be gained through the purchase of fishing licences, the development of joint venture fishing with coastal States and by carrying out fishing operations on still accessible fishing grounds off the shelf. In practice, fishing based on the 'historical basis' and licence purchasing proved to be less important than expected. What did undergo development was joint venture fishing and fishing in accessible grounds on the coasts of Namibia, the Falklands and the Antarctic. Apart from that, considerable importance was gained by fishing operations in the Northeast Pacific as a result of allowable catches allocated to Poland by the USA and Canada.

During the period of free access to resources, what decided about the amount of catches if the Polish deep-sea fishery was the potential catch possibilities. A continuous increase of the distances from fishing grounds did not have a negative influence on the fishing economy, as it was compensated by the technical progress being introduced on the new vessels. It was the fuel crisis that caused a real decline in the economical effectiveness of the fleet. Due to the new legal situation of the fishing grounds, a further increase had taken place in the exploitation of Polish deep-sea fisheries, since the aim was to utilize the existing fishing fleet as far as possible. What decided about the catch size was now the resource accessibility, which proved to be smaller than the catch possibilities of the vessels. During this period, catch expenses increased as a result of high fuel prices, licence fees, increasing rates for services of auxiliary fleet, Polish fixed assets and material prices, etc. By halting the construction of new ships, the influence of technical progress on limiting the increase in catch expenses was curbed. Thus, fishing during 1976-80 was conducted in a situation of constantly increasing unit costs - on average about 14% per year (Team work lead by Kasprzyk, 1982).

The dynamics of cost increases in obtaining protein in fisheries kept on a more rapid pace than in other fields of the food industry (Table 5). As a result of this, during the said period, fish protein came to be more expensive, not only from protein in dairy products, but also from poultry and egg protein. Only in comparison to meat had the cost of fish protein production remained in a more favourable position, but comparing this to 1975, here a decline was also noted (from 28% to 14%). Figure 1 shows the said tendency. It can be seen that there was a clear decline in the competitiveness of protein production in the fishing industry as comparing with other food products. Therefore, it can be concluded that, at present, the deep-sea fisheries in Poland has ceased to be a source of cheap food.

The effects of worsening catch conditions resulting from the limited access to fishing grounds, has been drastically experienced in Poland only as from 1981. Catches in deep-sea fishery decreased to 423 000 t, that is by 25% as compared with the previous year. At the same time, the fishing fleet tonnage was reduced only by 12%, due to the withdrawal of used vessels. This caused the underutilization of part of the fleet and consequently a decline in the productivity of fixed assets. A reduction was noted also in the effectiveness of work calculated by catch amount per one person employed. There was also a decline in the market supply, resulting in the drop in consumption to 6.8 *per caput*, i.e., close to the 1975 level.

Almost 90% of all catches came from fishing grounds 6 000-9 000 n mi away. The average distance from the fishing grounds increased only in one year by 900 n mi and amounted to 7 300 n mi. The cost of 1 kg of catches continued their upward trend and in comparison with 1980, increased by 18% (Team work lead by Kasprzyk, 1982).

The year 1981 was also a turning point with regard to joint venture fishing, which in the previous years was on the increase. During the said year, this dropped rapidly, mainly due to the break in cooperation with Peru. The cause of this was, on the one hand, a decline in the economic effectiveness of these catches due to rising fuel prices and rising prices of other supply materials, and on the other hand, a change introduced in 1979-81 concerning the operating conditions of fishing cooperatives in Peru.

The limiting of development of deep-sea fishery due to the introduction of economic zones and the worsening of this fishery's economic effectiveness, also influenced in Poland one of the most important branches of the national economy - the ship-building industry. The Polish ship-building industry was specialized, among others, in the production of fishing vessels, including fishing factory vessels and mother vessels. For several years this industry occupied first place in the export of such vessels. In 1981, comparing to 1975, the Polish production of fishing vessels of a tonnage of more than 100 GRT dropped by half (from 129 400 to 65 100 GRT). It should be noted that a similar trend is observed in these years also in the world production of fishing vessels. It declined in 1981 to the 55% level of the 1975 production (from 593 000 to 330 000 GRT).

5. THE FUTURE PROSPECTS OF THE POLISH DEEP-SEA FISHERIES

The aim placed before the Polish fishing industry for the following years remains the same as in previous years, i.e., supplementing the market with protein products. It can be even stated that its importance is increasing, as the consumption of meat in 1982-90 is expected to be lower than in 1980.

Past years' experiences and, in particular, 1981 resulted in the verification of earlier forecasts concerning the future of Polish deep-sea fisheries. These forecasts expect that in 1990: catches will be about 1 500 000 t; local market supply 332 000 t; export on the 150 000-t level of products, and the consumption level 9.3 kg *per caput* (Team work, 1973). Already today this is seen as being an unrealistic goal. Forecasts that are presently being prepared do not assume an increase in the volume of catches, but try to develop an operation strategy, that would allow deep-sea fishery catches to be kept on an annual level of 350 000-450 000 t (Team work lead by Kasprzyk, 1982). These quantities result from the state of the existing fishing fleet and from the analysis of the expected access to fishing grounds, taking into account the economic profitability criteria, the importance of which had increased since fisheries had ceased to be a source of cheap food in Poland.

The fishing fleet will become smaller up to 1985, since no new vessels shall enter it (apart from two supertrawlers with a main engine of 5 200 hp each, designed in 1974-75) and 35 technically used trawlers will be withdrawn. The theoretical catch capacity of the Polish deep-sea fishing fleet will amount, at that time, to about 450 000 t. Therefore, the fundamental task will then be to fully utilize this fleet. In the years 1986-90 a further 23 trawlers shall be withdrawn causing a decline in catch capacity of 125 000 t. To maintain the calculated catch level, it will be necessary to re-inforce the fishing fleet. It is assumed that these new vessels will be adapted to fishing in open waters and to joint venture fishing. It is also expected that smaller vessels of 45-75 m in length, applying less energy-consuming fishing techniques, shall be incorporated into the fleet.

A remark should be made here about the fact that, at present, as well as in the future, fishing in the Polish Fishery Zone in the Baltic Sea will be given first priority. The reason for this is that access to these resources is certain, that the share of these catches in the total fish consumption is considerable (almost half of the total local market supply) and that the cost of catching 1 kg of fish are lower by half compared with deep-sea fishery. A fuller utilization of deep-sea enterprise ports and their services in processing and utilizing Baltic Sea catches is also expected.

Forecasts are also being prepared with regard to catching cattle fish and medium and small-size pelagic fish species in open waters. The exploitation of Antarctic krill is also being considered. Action shall be taken in order to gain possibilities to catch in the fishing grounds off the shelf, mainly in various types of cooperations (licences, purchasing fish from coastal fishermen, varying types of fishing cooperatives). Special attention shall be paid to the improvement of the processing of these fish species, that up till now have not been accepted by consumers or have been used as fodder.

6. DEEP-SEA FISHERY IN THE STRATEGIES OF THE FUTURE DEVELOPMENT OF WORLD FISHERIES

The experience of the Polish fishing industry indicates that access to resources in zones of coastal States shall become more limited for foreign fishing fleets. This shall be done by administrative measures, as well as economic ones. The tendency for the rational utilization of resources in the fishing zones of developing countries will cause the development of local fishery of these countries based on their own, proven experience and on some experiences of other countries. Poland presumes that the latter kind shall consist mainly in transfer of technology, assistance in locating fishing grounds and management of resources and also training of staff[1/]. Prior to the time of reaching a certain level of development of own fishing industry, there will be a surplus of under-utilized resources in the zones of these countries, which might be exported in a manner of selling fishing licences. This surplus could also lead to the development of other types of international cooperation.

In coastal zones of some developed countries, there also exist possibilities of utilizing resources by other countries. Such possibilities stem, not so much from capital and technical limitations of the coastal States, but from the lack of interest in catches of some fish species. This may be a result of local market preferences, as well as the non-profitability of exploiting less valued species (e.g., blue whiting in Great Britain or Alaska pollock in the USA).

With regard to the aid for developing countries, Poland's stand was presented at the Fourteenth Session of COFI in 1981. In brief, it consists of a proposal to provide assistance in kind - a research vessel, training of fishermen, surveying of fishing grounds and supplying of prototypes of modern fishing gears. Poland is also trying to obtain the right to fish (on payment) in other fishing zones and also wishes to enter into fishing cooperatives almost totally bringing the required capital in kind.

1/ Details of this assistance were laid down by the Fourteenth Session of COFI in May 1981, Rome

Apart from these proposals of cooperation within the economic zones, Poland is also interested in cooperating in the field of exploitation of the resources remaining outside the economic zones. In the strategies of development of world fisheries, also the activity guidelines aiming at a fuller utilization of living resources of the open seas should be taken into account, particularly in the Atlantic, Pacific and Antarctic regions (Draganik, 1982; Popiel and Borowski, 1982). This concerns the catching of large pelagic fish (tuna, sharks), as well as exploiting medium and small pelagic fish (blue whiting, horse mackerel, saury, ray's bream, chub mackerel, fish of the Engraulidae family) and krill resources. The experience gained from the exploitation of squid living outside the 200-mi zones indicated that such catches can compete with fish catches.

Fishing of the mentioned resources in open waters require the usage of specialized fleets, forcing the entire fleet to act as one single organism, scientific and scouting vessels included (Popiel and Borowski, 1982). Countries now prepared to exploit these resources are those which have a developed deep-sea fishery. Though the development of fisheries on a larger scale requires a series of further expensive research work in the field of resource distribution and its size, techniques and technologies of catching and processing and other factors influencing the exploitation effectiveness. The necessity of a speedy increase in fishing of the said resources requires undertaking intense research in international cooperation, in order to distribute the high costs of research among a larger number of countries and to shorten the time of their realization.

Poland is interested in the above research and is already in possession of a considerable amount of experience in the exploitation and utilization of Antarctic krill which could be made use of in cooperation with interested countries. As mentioned earlier, according to Polish calculations, catching of krill for consumption and fodder purposes could well bring profit when bases for krill catching would be located close to Antarctic fishing grounds. Poland has already mastered the krill-catching technique and a semi-technical advanced technology of processing it for consumption. Apart from that, the industrial technology for processing krill into fodder has been mastered in full, as well as the production of chitin. It is possible that a project of an appropriate international trust of countries that own territory close to the Antarctic, the capital and technology would be a proper solution, that would allow a considerable increase of protein production from these sea organisms.

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APPENDIX

Selected Problems of the Polish Baltic Fishery

1. FLEET, FISH CATCHES AND EMPLOYMENT

Basic information regarding fleet, fish catches and employment in the Polish Baltic fishery during the 20 years, 1960-81, is presented in the attached Annex. This information is divided into three sectors of ownership of means of production: state enterprises, fishing cooperatives and individual fishermen. Within State enterprises, we perceive a clear tendency for the increase in the size of trawlers used. At present, trawlers of about 25 m in length are being operated. Fishing cooperatives and individual fishermen are conducting their fishing operations with trawlers ranging from 13 m to 25 m in length. On fishing grounds closest to the coast, catches are being carried out using motorized fishing boats.

A more rapid development of deep-sea fishery in comparison with a lower rate of development of the Baltic fishery in Poland in 1960-75 caused a decline in the share of the latter in the total fish catches from 49.2% in 1960 to 26.2% in 1975. As a result of the introduction of EEZs, in the following years the importance and share of the Baltic fishery in the Polish fish catches increased (33.2% in 1981). Three fish species dominate the Baltic fish catches: cod, herring and sprat. It is anticipated, that in the future, the size of Polish fish catches in the Baltic will remain approximately at the present level, i.e., about 180 000-200 000 t per year. No change is being considered in the manner that the three sectors are sharing catches in the Baltic.

It should be noted that the Baltic fishery constitutes the sole source of supplying the local market with fresh fish and the unit cost of catches is evidently lower than that in deep-sea fishing. Furthermore, it requires lower investments and lower energy consumption.

The future anticipated stable level of the Polish Baltic fish catches allows for a prediction of the maintenance of the employment level reached in the past years. The existing developed professional education guarantees a continuous influx of trained staff. In characterizing the Baltic fishery employment, it should be stated, that in 1981 it constituted 28% of the total employment in the fishing industry, whilst Baltic fishermen made up 32.6% of the total number of the employed sea fishermen in that year.

2. MANAGEMENT OF CATCHES WITHIN THE NATIONAL FISHERY ZONE AND TERRITORIAL WATERS

The Polish fishery zone in the Baltic Sea was established in 1977. It stretches off in different points to about 35 or 60 n mi from the baseline (shoreline, plus 3 mi of territorial water strip) and borders with the zones of the German Democratic Republic, Denmark, Sweden and the USSR. Starting from 1974 - when the International Baltic Sea Fishery Commission was founded - all national fishery regulations and protective measures being promulgated locally have conformed to the Fishery Rules and Recommendations issued every year by this Commission. There are eight kinds of regulatory measures applied and listed in Article X of the Convention, like the minimum catch-size of fish, closed seasons, etc.

The most important and effective management measure turned out to be the Total Allowable Catch Quotas (TAC), recommended by the Commission every year to each of the seven member States in reference to: herring, sprat, cod and salmon.

The annual TACs set in this way for Poland are apportioned by the Government to three sectors of fishery: State enterprises, cooperative and private fishing-boat operators. The authorities of each sector divide their share among the companies or individual boat operators.

Complaints are sometimes registered before the Government by individual operators for the allegedly unjust share allotted to them. In October 1982, the Government was confronted with a fishermen's protest on a much wider scale when it established a ban on herring fishery after the national TAC was exhausted.

Within the private sector, we can distinguish two groups of fishermen. The first includes coastal fishermen using boats with engines of 10-40 hp, with a crew of 2-3 men. They fish in the distance of 6-10 n mi offshore mainly using hooks and lines or surface nets.

The second group consists of fishing boat operators using trawlers with engines of 50-300 hp and a crew of 4-8 men. They catch fish mainly with bottom- or mid-water trawls, at a distance of up to 60 n mi offshore, staying out at sea for 1 or 2 full days.

It should be underlined that for over 20 years, no conflict of interest between the two said groups has been noted.

The dividing line between them results from the Government's ban on catching fish with the use of trawls in coastal areas of less than 20 m water depth. Just this 20 m isobath constitutes a firm boundary line between the Baltic Sea fishery and coastal fishery.

The coastal fishery in the Baltic is extremely strenuous for fishermen who wish to earn their money this way. Hence, during the seventies, the coastal fishery suffered from the shortage of manpower. The young fishermen preferred to look for better paid jobs in deep-sea fishing. As from 1980-81, the profession of coastal fisherman became more attractive, due to the rise in fish prices.

The number of boats in the Polish Baltic fishery is strictly licensed. During the eighties, no increase in the number of boats or fishermen is predicted. Instead, modernization of fishing vessels and gears will take place.

3. THE STATE OF MARICULTURE

Mariculture in Poland (in some parts of the southern Baltic close to the shoreline) is really connected with only two lines of activities:

- rearing of trout in sea water within the inlets and gulfs close to the Vistula estuary, and
- stocking of sea water with fish fry.

The biotechnology of rainbow trout rearing was mastered by the Sea Fisheries Institute in Gdynia during a series of experiments conducted in 1976-80.

The stocking of sea water with smolts was initiated as early as the late fifties. Towards the end of the seventies, however, water pollution of some areas had a detrimental effect upon the stocks of trout, eel and pike in the Gdańsk Gulf. A programme of counteractive measures against pollution has been launched in recent years.

At present, the still experimental rearing of rainbow trout in the Puck Bay (part of Gdańsk Gulf) produce on average 10-12 t every year.

The annual stocking (by Poland) of the amount of 250 000 smolts accounts for catches of 80-100 t of sea trout (salmo trutta) in the Polish Fishery Zone, two-thirds of which is extracted by foreign fishermen, together with the bigger catches of salmo salar originating from the Swedish and other countries' hatcheries.

ANNEX

Basic Figures Characterizing the Polish Baltic Fishery in the Years 1960-81

Specification	1960				1965				1970			
	Baltic fishery in total	divided:			Baltic fishery in total	divided:			Baltic fishery in total	divided:		
		state enterprises	fishing cooperatives	private fishermen		state enterprises	fishing cooperatives	private fishermen		state enterprises	fishing cooperatives	private fishermen
1. The Fleet a/number of trawlers	524	233	142	149	533	246	134	153	545	226	143	176
number of motorized and non-motorized boats	993	-	572	421	891	-	531	360	976	-	504	472
b/tonnage in thous.GRT[a/]	19.9	12.6	4.1	3.2	25.0	15.7	5.7	3.6	25.8	15.1	6.5	4.2
c/engine power in thous.HP[a/]	60.3	34.0	13.8	12.5	68.8	39.8	15.8	13.2	73.8	39.2	18.7	15.9
2. Catches in thous.tonnes /live-weight/	82.8	42.3	21.0	19.5	84.6	51.4	21.9	11.3	146.7	94.2	31.9	20.6
3.Total labour force in thous.	12.2	6.4	3.4	2.4	10.0	4.5	3.6	1.9	11.9	5.7	3.8	2.4
sea fishermen	5.2	1.6	1.3	2.3	4.7	1.4	1.4	1.9	5.5	1.8	1.4	2.3

[a/] refers only to trawlers

LA PECHE MARITIME AU SENEGAL
ETUDE DE CAS

par

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RESUME

SITUATION DE LA PECHE

La pêche maritime a produit en 1981 230 000 t pour une valeur de CFA.F. 28 milliards. Elle représente un secteur d'activité important pour:

- les investissements réalisés:
  . armements: plus de 250 unités industrielles, 10 000 pirogues
  . usines: 30 entreprises de congélation;
- la main-d'oeuvre employée: 10 % de la population sénégalaise;
- le ravitaillement de cette population;
- l'équilibre de la balance commerciale: 30 000 t exportées en 1981 pour CFA.F. 37 milliards.

LES PROBLEMES DE LA PECHE

Les ressources sénégalaises sont pour beaucoup, saisonnières et fortement entamées.

La pêche artisanale à qui la bande de 6 milles marins est réservée, est fortement motorisée mais connaît des difficultés de distribution et de coût de production.

La pêche industrielle connaît des difficultés

- de ressources en poissons
- de vétusté de la flottille
- de coût de production

Au niveau de la transformation-distribution

La distribution intérieure (pêche artisanale) est encore trop restreinte géographiquement. Les exportations de poissons "nobles" (Europe) plafonnent; celles de poissons à prix unitaire faible (Afrique) sont encore en grande partie potentielles.

POLITIQUE DE LA PECHE

La tutelle administrative est assurée par un Secrétariat d'Etat qui encourage le mouvement coopératif.

Le code de la pêche maritime a défini, depuis 1976, des eaux territoriales de 100 milles et une zone exclusive de pêche adjacente de 50 milles.

Dans ces limites, l'exploitation est riguoureusement réglementée: effort de pêche, type d'unités, maillage, etc.

Les moyens de la politique sont fondés sur

- une aide financière: CEPIA et Crédit maritime
- une recherche appliquée: CRODT
- une formation professionnelle.

Les investissements prévus au VI^{e} Plan (1981-85) dépassent CFA.F. 27 milliards. Ils intéresseront:

- les infrastructures portuaires et les équipements;
- l'armement industriel, soutenu par des aides à l'investissement (Crédit maritime) et à l'exploitation ainsi que par des mesures administratives;
- la pêche artisanale dont les moyens seront modernisés et la production accrue (CAMP, CAPAS).

La politique en faveur du commerce extérieur consistera en

- l'approche de nouveaux marchés
- l'incitation à la prise de participation locale
- le groupement et la modernisation des transformateurs;
- la création d'un "label Sénégal".

Pour la pêche artisanale l'Etat s'emploie à élargir des réseaux de distribution et à améliorer les moyens de conservation.

La Coopération internationale est actuellement régie par:

- le principe de la substitution de nouveaux accords de pêche aux anciens, selon la formule des compensations;
- la recherche d'ententes sous-régionales.

1. SITUATION DE LA PECHE

1.1 Production

A compter de 1977/78, la connaissance de la pêche artisanale s'est affinée et les évaluations des apports, jusque là surestimés, sont en baisse.

Même indépendamment de ce réajustement, se dégage pour la production piroguière une tendance moyenne à la diminution.

La production des cordiers s'accroît régulièrement. Celle des bateaux industriels, à nombre d'unités constant, s'est fortement réduite cette année (rendement) (p par unité: 569 t en 1980, 315 t en 1981).

	Tonnage		Valeur estimée (CFA.F. 10^6)	
	1976	1981	1976	1981
Pêche artisanale (trad.)	276 260	147 720	18 790	10 820
(amélior. cordiers)	390	800	50	180
Pêche industrielle	74 210	80 790	6 210	17 060
Total	350 860	229 310	25 050	28 060

1.2 L'armement

	1976	1981
Nombre de pirogues à voile	2 257	4 180
à moteur	3 843	4 931
Cordiers	6	11
Sardiniers	12	14
Chalutiers	80 (43 Sénégal)	175 (110 Sénégal)
Thoniers	42 (14 Sénégal)	67 (4 Sénégal)

1.3 Les pêcheurs

	1976	1981
Nombre d'artisans	49 001 ?	31 725

1.4 Le disponible en poisson

	Tonnage (t)		Valeur estimée (CFA.F. 1 000)	
	1976	1981	1976	1981
Production totale	350 860	229 310	25 050	28 060
Consommation intérieure	305 270	139 106	-	-
Exportations	45 590	90 204	-	37 500

1.5 Rôle socio-économique du secteur

La pêche artisanale a

- un rôle social: 90 % de la population sénégalaise en vit directement ou indirectement;

- un rôle nutritionnel: elle participe essentiellement au ravitaillement des populations.

La pêche, industrielle via la transformation industrielle, fournit essentiellement les marchés d'exportation (importante source de devises).

2. LES PROBLEMES DU SECTEUR

2.1 L'exploitation

2.1.1 Les ressources

Les stocks sont:

- pour beaucoup saisonniers (sardinelles rondes, thons etc.);

- fortement entamés.

Le Centre de recherches océanographiques de Dakar-Thiaroye (CRODT) estime que, par rapport à la production moyenne actuelle, les stocks encore disponibles peuvent être chiffrés ainsi:

Ressources	Disp. pour p. artis. (t)	Disp. pour p. indust. (t)	Total disponible (t)
Pélagiques	16 000	81 300	97 300
Démersaux	13 600	10 000	23 600
Océaniques	3 000	8 000	11 000
Total	32 600	99 300	131 900

Théoriquement donc, compte tenu des captures actuelles,

- la pêche artisanale ne disposerait que d'une marge d'accroissement étroite, de 20 %;

- la pêche industrielle pourrait plus que doubler ses prises (+ 120 %).

Le problème des ressources disponibles qui se poserait pour la pêche artisanale, ne se poserait pas pour la pêche industrielle, encore qu'il faille orienter les efforts de pêche supplémentaires vers les pélagiques. Les espèces du talus (stocks en cours d'évaluation) sont à l'heure actuelle exploitées par les navires étrangers.

2.1.2 La pêche artisanale

La zone des 6 milles est, en principe, entièrement réservée à la pêche artisanale.

La fréquentation des pêcheries de plus en plus éloignées, l'usage d'engins lourds (sennes), le besoin d'autonomie, ont fortement hâté la motorisation des pirogues (aide de l'Etat) avec:

- des problèmes ponctuels d'engorgement du marché qui, faute de moyens de conservation adéquats et suffisants, ne peut absorber normalement de gros apports, concentrés dans le temps;

- des répercussions des chocs pétroliers (consommation 9,1 millions de litres de gazole en 1981) sur le prix de revient de la pêche.

La pirogue, embarcation traditionnelle, quoique bien adaptée, reste perfectible, quant à

- sa stabilité
- la capacité de conservation de ses prises
- le coût - achat entretien, durée de vie - du moteur hors-bord actuellement utilisé.

2.1.3 La pêche industrielle

La pêche industrielle est confrontée à des difficultés

- de ressources disponibles, notamment en poissons démersaux dont les prises plafonnent actuellement et qui entretiennent un flux d'exportation important vers l'Europe
- de vétusté

Bateaux	Age moyen (ans)
Chalutiers inf. 50 TJB	17
Chalutiers 50 à 150 TJB	21
Chalutiers sup. 150 TJB	15
Sardiniers	19
Thoniers canneurs	24

Un renouvellement de la flottille est indispensable qui ne se ferait pas sur une initiative privée, le secteur armement étant réputé non rentable ou, au moins, à haut risque. Le déséquilibre de l'exploitation, surtout chalutière, est dû à la réduction des aires de capture traditionnelle (restriction imposée par les pays voisins) et à l'augmentation des charges d'exploitation plus rapide que la progression des prix de vente du poisson.

- de coût de production

L'incidence des charges de carburant sur les charges globales est d'environ 30 %. On comprend que l'augmentation du gazole (consommation 35 000 m^3 en 1981) ait des répercussions fâcheuses sur les comptes d'exploitation (changes augmentés de 9 % lorsque le prix du gazole augmente de 30 %).

- de concurrence avec les flottilles étrangères non autorisées

Faute de moyens de surveillance suffisants, les zones interdites et la Zone Economique Exclusive sénégalaise souffrent de l'intrusion (fréquente?) de bateaux de fort tonnage qui "pillent" frauduleusement les stocks. Ces bateaux, repoussés par l'extension des eaux sous juridiction nationale, transfèrent leur effort de pêche à l'Atlantique tropical.

2.2 La transformation - distribution

2.2.1 La pêche artisanale

Nous l'avons dit, elle ravitaille le marché intérieur. Le poisson est livré:

- en frais: faute de moyens de stockage à l'intérieur (chambres frigorifiques relais), l'aire de distribution du poisson frais est très restreinte et n'intéresse pratiquement que les régions côtières, accessibles en quelques heures;

- en transformé: la transformation traditionnelle (salage, séchage, fumage) n'est généralement qu'un pis-aller:

  - on traite le poisson, faute de pouvoir le vendre en frais (invendus non conservables d'autres manières, marchés éloignés);

  - le traitement n'est pas toujours une valeur ajoutée: le poisson traité est vendu moins cher (équivalent frais) que le poisson non traité.

Il convient cependant de noter que, pour une faible part sans doute, le poisson traité joue un rôle culinaire traditionnel (condiment, goût particulier).

Le réseau de distribution - privé - qui fonctionne actuellement favorise les régions côtières et les centres de consommation les plus lucratifs. Les régions de Louga, du Fleuve (où la production du fleuve Sénégal a chuté de façon catastrophique) et du Sénégal-Oriental ne sont pratiquement pas intéressées par le mareyage.

Un obstacle majeur se fait jour: le faible pouvoir d'achat des consommateurs pré-détermine en quelque sorte le prix de vente. Dans ces conditions le poisson en bon état est vendu comme un poisson de qualité moindre et "la qualité n'est pas payante".

2.2.2 La pêche industrielle

C'est d'elle que dépendent, pour la quasi-totalité, les exportations qui jouent un rôle important (3e poste) pour l'équilibre de la balance commerciale. La plupart des installations de transformation sont situées à Dakar.

Il existe deux flux d'exportation: vers l'Europe et vers l'Afrique.

Les exportations vers l'Europe (poissons de fond, crevettes, conserves de thon) plafonnent, comme les ressources elles-mêmes. Il y a ici un marché ancien dont les Sénégalais ne tirent presqu'aucun bénéfice direct. Les circuits sont actuellement trop bien intégrés au sein de sociétés étrangères, au détriment des intérêts locaux qui se cantonnent à l'armement, rarement à la transformation, jamais à la commercialisation. Or, dans la chaîne capture-transformation-distribution le partage des marges est très inégal. L'armement ne reçoit pratiquement rien, la transformation en capte quelque part (sans rapport d'ailleurs avec son degré d'intervention) mais c'est la commercialisation qui en reçoit l'essentiel.

Les exportations vers l'Afrique (poissons du type sardinelle, de faible valeur unitaire). Il y a là un marché important, déjà constant avec la Côte-d'Ivoire mais surtout potentiel pour les autres pays du golfe de Guinée, très demandeurs. Les produits sénégalais s'écoulent difficilement, face à une concurrence très dure des pays de l'Est (URSS, Pologne, Cuba). Le goulot d'étranglement ne réside pas au niveau des industries de traitement très largement équipées (voire suréquipées) et en mesure de faire face à un accroissement important de la demande extérieure. Il réside au niveau des structures commerciales qui pêchent par leur manque d'organisation, ce qui conduit à l'incapacité de fournitures régulières et à la livraison de produits de qualité inégale. En outre, la plupart des importateurs africains se plaignaient de la médiocrité des emballages des produits sénégalais.

3. LA POLITIQUE DE LA PÊCHE MARITIME

3.1 L'organisation - Les structures

3.1.1 Structures administratives

Pour concrétiser la place de la pêche dans l'économie sénégalaise, il a été créé en 1979 un Secrétariat d'Etat à la pêche maritime qui assure la tutelle d'une direction de l'océanographie et des pêches maritimes et se veut une administration de développement, non de gestion.

Les structures du Secrétariat d'Etat son actuellement à l'étude, qui lui permettront de poursuivre les objectifs fondamentaux suivants:

- tirer le meilleur parti des ressources disponibles,
- favoriser le développement de l'armement national,
- améliorer la consommation nationale de poisson,
- développer les exportations.

3.1.2 Structures professionnelles

Dans le secteur artisanal l'accent est mis sur une meilleure organisation du mouvement coopératif. Il existe actuellement 121 coopératives de pêcheurs, regroupées dans une toute récente Union nationale.

Pour ce qui est du secteur industriel, un Groupement des armateurs et industriels de pêche au Sénégal (GAIPES) existe, interlocuteur unique des pouvoirs publics.

3.2 La législation

La base des actions de l'Etat est le Code de la pêche maritime (1976) qui est en cours de révision.

Ce code

- fixe la largeur des eaux territoriales: 150 milles mesurés à partir des lignes de base, et celle de la zone contiguë, dite "zone exclusive de pêche"; 50 milles au delà des eaux territoriales. Le code étant paru avant l'instauration de ce qu'on convient d'appeler "le nouveau droit de la mer", ce droit n'est en fait pas nouveau pour le Sénégal;
- organise l'exploitation: bandes des 3, 6, 12, 50 et 200 milles marins;
- prend des mesures de conservation: maillage, spécifications des pêches pratiquées et des tonnages.

Un projet de "protection et surveillance" est en cours de démarrage qui doit appuyer la protection des zones de pêche et permettre le respect des accords de pêche . Ce projet a un intérêt national mais aussi sous-régional, aucun des pays voisins n'ayant pris, individuellement, les moyens d'assurer une surveillance satisfaisante de ses pêcheries.

3.3 Les moyens

Les moyens pour appliquer la politique de la pêche sont:

(a) une capacité de financement, incitatrice et modulable:

- une Caisse d'encouragement à la pêche et à ses industries annexes (CEPIA) a été créée en 1968 qui, ne fonctionnant plus de manière satisfaisante, fait actuellement l'objet d'étude de redynamisation;
- un crédit maritime est mis en place depuis 1981, qui a pour but d'aider les armements et installations de transformation industriels.

(b) une recherche appliquée. La recherche indispensable est menée par le Centre de recherches océanographiques de Dakar-Thiaroye (CRODT) sous l'égide du Secrétariat d'Etat à la recherche scientifique et technique;

(c) une formation professionnelle adaptée. La formation, tant des navigants que des cadres administratifs et des opérateurs économiques, répond mal aux besoins actuels.

3.4 Les investissements

3.4.1 Le sixième Plan de développement économique et social (1981-85)

Suite aux récents réajustements (1982), le Plan comporte les projets suivants:

Secteurs	Intitulés	Coût (CFA.F. 10^6)	dont financement extérieur	Observations
Pêche artisanale	- Motorisation des pirogues	850	-	-
	- Projet CAPAS	1 600	1 300	1 300 acquis (Canada)
	- Centre de pêche de Kafountine	390	300	300 à rechercher
	- Expérimentation des doris	20	20	20 acquis (CEE)
Pêche industrielle	- Réarmement thonier	390	390	390 acquis (FAC)
	- Crédit maritime	7 200	5 265	4 283 à rechercher
	- Protection, surveillance des pêches	3 095	3 095	3 095 acquis (Canada)
Aquaculture	- Elevage crevettes	135	135	135 acquis (FAC)
Formation	- Equipement/rénovation Ecole formation maritime	346	-	-
	- Ecole des agents techniques océanographes/ pêches maritimes	80	-	56 à rechercher
Equipement	- Complexe frigorifique Ziguinchor	375	375	375 acquis (Italie)
	- Port de Djiffer	2 950	2 500	2 500 à rechercher
	- Port d'Elinkine	9 650	9 000	9 000 à rechercher
Totaux	13 projets	27 081	22 380 (83 %)	16 140 à rechercher (60 %)

La réalisation des projets du plan dépend, pour plus de 80 %, de la participation extérieure: aide (subventions ou prêts) des pays ou organisations amis, compensations des accords de pêche.

L'effort de l'Etat reste important: 20 % des investissements (4,7 milliards). Le secteur pêche étant considéré comme un support essentiel du Trésor sénégalais, ce minimum doit lui être assuré pour lui permettre de jouer ce rôle.

3.4.2 Les infrastructures portuaires et les équipements

- Infrastructures

L'Etat veut faire participer les régions autres que celle du Cap-Vert (Dakar où d'ailleurs la construction du môle de pêche est bien avancée) aux activités maritimes par la création de ports de pêche secondaires. La construction des infrastructures de Saint-Louis est acquise. Celle de Djiffer et d'Elinkine-Nikiné n'a pas encore trouvé le financement nécessaire, alors que les études sont d'ores et déjà disponibles.

- Equipements frigorifiques (chaîne du froid)

La création de complexes frigorifiques dans les régions se poursuit, devant aboutir à l'élargissement de l'aire de distribution du poisson frais et, donc à l'amélioration de la ration des populations de l'intérieur. Sont réalisées ou en chantier notamment les installations de Saint-Louis, Yoff, quai de pêche de Dakar, Tambacounda, Kolda, Fatick, Louga, Bambey et Bakel.

3.4.3 L'armement

3.4.3.1 Pêche industrielle

Le double objectif de la politique menée en ce domaine est de:

- favoriser l'armement national: jusqu'ici l'obstacle majeur était la timidité de la mobilisation des capitaux sénégalais, due à une épargne peu importante et à un crédit d'accès difficile;

- renouveler la flottille qui est très âgée: coût estimé de ce renouvellement: CFA.F. 13 milliards.

Trois actions doivent permettre de réaliser cet objectif:

(a) Aide à l'investissement

L'Etat vient de mobiliser un fonds pour le démarrage d'un crédit maritime abrité par la Société financière sénégalaise pour le développement de l'industrie et du tourisme (SOFISEDIT) afin de financer des projets d'armement (pêche industrielle et semi-industrielle) et d'équipements à terre.

Le crédit maritime doit permettre à moyen terme

- les investissements des nationaux qui auront enfin accès à une structure de financement spécifique, aux conditions requises pour la pêche maritime: très long terme et faible taux d'intérêt;

- la prise de participation (minoritaire) par l'Etat au capital des sociétés à "promouvoir", génératrices d'emplois et/ou devises.

(b) Mesures administratives

Elles sont acquises ou en préparation:

- aménagement du code de la pêche maritime;

- gel des importations de petits chalutiers qui, en raison de leur faible autonomie, ne disposent plus que de fonds appauvris;

- négociations d'accords de pêche avec les pays voisins;

- mise en place d'une politique douanière favorable à l'importation d'équipement de pêche.

(c) Aide à l'exploitation

- ristourne accrue sur le gazole (actuellement 10 % de son prix public);

- meilleure étude des coûts des prestations de service des chantiers de réparation navale.

3.4.3.2 Pêche artisanale

C'est un secteur dynamique, vital, important économiquement et socialement, dont le développement doit être promu harmonieusement.

(a) Modernisation des unités

Axée sur la motorisation et l'équipement des pirogues, elle relève du Centre d'assistance à la motorisation des pirogues (CAMP) qui fonctionne depuis 1972, grâce à des ressources canadiennes. Le CAMP a pour principales fonctions:

- la fourniture de moteurs hors-bord et de pièces détachées;
- la création de structures pour la distribution des moteurs et le service après-vente;
- la mise en place d'un système coopératif.

En 1981, 722 moteurs ont été fournis par le biais des coopératives, 275 au comptant, pour une valeur globale de CFA.F. 179 millions.

Parallèlement, un armement cordier (la Coopérative sénégalaise d'armement à la pêche artisanale, COSAPAR) fonctionne actuellement à titre pilote. On est là dans le secteur de la pêche artisanale améliorée, situé à la frontière de la pêche industrielle (quant aux moyens mis en oeuvre) et de l'armement artisanal (quant aux structures du capital et son volume). Ce secteur peut être particulièrement stimulant pour un milieu artisanal ouvert au progrès et désireux d'acquérir des moyens techniques de production modernisés.

(b) Accroissement de la production

L'accroissement numérique des pirogues ne devant vraisemblablement pas, à moyen terme, dépasser l'accroissement de la population de pêcheurs elle-même, l'accroissement de la production doit provenir des améliorations techniques ainsi que de la mise de crédits à la disposition des artisans.

Le Centre d'assistance à la pêche artisanale sénégalaise (CAPAS) cherche à mettre au point des techniques adaptées au parc piroguier, pour améliorer la production en même temps que la productivité, diminuer les coûts de production (expérience d'introduction du moteur diesel) et aussi valoriser cette production (conservation à bord).

Le CAPAS intervient également, on le verra, au niveau de la commercialisation des produits de la pêche.

3.5 La commercialisation des produits de la pêche

3.5.1 La transformation industrielle et le commerce extérieur

L'objectif est d'accroître les exportations pour participer au rééquilibrage de la balance commerciale.

Une part importante des exportations (en valeur et tonnage) alimente les marchés européens, principalement la France, tandis que la part des exportations vers les pays africains reste relativement faible, faute de structures commerciales adaptées.

Si la capture des espèces intéressant l'Europe tend à plafonner (sauf exceptions à exploiter), l'effort de pêche peut être en revanche augmenté en direction des côtes pélagiques qui intéressent surtout les marchés africains.

- La commercialisation vers l'Europe
  - . objectifs guidant la politique actuelle;
  - . approche des marchés non traditionnels, ce qui devrait permettre de diversifier la clientèle et d'être moins tributaire des réseaux commerciaux actuels qui échappent totalement aux intérêts sénégalais;
  - . incitation à la prise de participation d'intérêts sénégalais dans les sociétés d'exportations;
  - . attribution d'une subvention à l'exportation pour les conserves de thon.

- La commercialisation vers l'Afrique

La profession des transformateurs manque de cohésion, cohésion précisément nécessaire pour ouvrir les marchés africains qui exigent la régularité des apports, des prix et de la qualité.

La politique à suivre est de faciliter le regroupement des transformateurs, l'harmonisation des efforts d'exportation, la rénovation des installations pour laquelle, le Crédit maritime peut jouer un rôle incitateur important - et la prospection des marchés.

Enfin, il conviendra de libéraliser l'importation des emballages cartonnés. Il conviendra aussi de créer un label Sénégal que l'Etat délivrera à des produits frais et normalisés.

3.5.2 La transformation et la distribution des produits de la pêche artisanale

Les actions entreprises, au travers du CAPAS surtout, visent à implanter des réseaux de distribution dans les zones actuellement les plus mal desservies: créations au niveau des centres d'éclatement d'installations frigorifiques de stockage (voir équipement).

Des actions sont aussi nécessaires pour améliorer le traitement artisanal qui intéresse encore une part importante de la production. Des moyens financiers - notamment ceux de la CEPIA - seront trouvés pour réaliser des aires de séchage et des fours améliorés. Actuellement, une subvention est allouée pour favoriser l'exportation des produits transformés artisanalement.

3.6 La coopération internationale

La politique de coopération vise à tirer le meilleur parti des ressources disponibles.

La pêcherie sera organisée pour en tirer le maximum, sans jamais compromettre l'équilibre des stocks (redéploiement sur les pélagiques côtiers), tout en donnant accès pour les nationaux aux moyens de production.

Cela veut dire qu'on tend à long terme vers la disparition progressive des accords de pêche, appelés à s'effacer à mesure que s'accroîtra le potentiel sénégalais de production et à être remplacés par des sociétés mixtes intégrant la commercialisation. Actuellement, le principe fondamental dans les négociations avec les pays étrangers est de substituer d'éventuels nouveaux accords aux anciens, selon la formule des compensations:

- paiement de droit de pêche;
- versement de fonds de contrepartie (subvention, prêts à long terme);
- investissements dans les unités (ce qui résoudra en partie le problème de renouvellement de la flottille: livraison de 12 chalutiers par la Pologne et éventuellement de cinq thoniers) et dans les infrastructures en matière de pêche (frigorifique de Ziguinchor par l'Italie).

On veille en même temps à limiter le nombre de navires pour tenir compte du potentiel, à faire débarquer au Sénégal tout ou partie des captures, à embarquer des marins, à accroître les efforts de recherche, de formation et enfin à obtenir pour les produits sénégalais, les mêmes exonérations que les produits pêchés dans la zone économique exclusive par les partenaires.

Ces principes qui guident les accords dits de deuxième génération, ont déjà été appliqués lors des négociations avec la Communauté Economique Européenne (premier accord en 1979) et avec l'Espagne (1979).

Pour ce qui est de la coopération sous-régionale, un accord a été passé avec la Côte-d'Ivoire (1979) plutôt comme pays-débouché de la production, et avec la Gambie (1982). Des négociations se poursuivent avec la Guinée-Bissau et la Mauritanie.

La coopération sous-régionale apparaît indispensable

- les stocks communs sont nombreux

- aucun pays pris isolément ne peut rentabiliser ses investissements en se cantonnant à exploiter uniquement les ressources des eaux placées sous sa juridiction.

SOMALIA'S FISHERIES
CASE STUDY

by

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ABSTRACT

General

Somalia is with an income *per caput* of US$ 185 one of the poorest countries in the world. Its four million inhabitants, who traditionally subsist mainly on nomadic pastoralism, have been victims of a series of disasters in recent years. It is only in the last decade that major attention has been given to the fisheries sector.

Physical Setting and Resources

Fish resources in Somalia are relatively modest despite long coastline, due to a rather narrow continental shelf. Still, only a fraction of the estimated annual catch potential is currently exploited.

Fisheries Production

Only 2% of Somalia's population is currently engaged in the fisheries sector to any extent, mostly through small-scale fishing. Lack of infrastructure puts severe restrictions on production and processing in both the artisanal and industrial sectors. Deep sea trawling is a recent introduction accounting for rather moderate catches. Total fish production in Somalia is still under 15 000 t a year.

Government Policies and Development Strategies

Since 1974, the Somali Government has given high priority to fishery development, though objectives have tended to be overly ambitious and the strategies vague. Overall policies are in a phase of change at present from a highly centralized system with strict Government control to a more open structure with increased private participation.

Fisheries Legislation

There is no separate law on fisheries in Somalia. Current fisheries legislation is hence diffuse and scattered within other laws falling well short of present requirements.

International Aid

International aid is pouring into Somalia's fisheries sector at unprecedented levels, though there are questions as to the appropriateness of many assistance programmes. Lack of adequate background knowledge of local conditions and concentration on capital-intensive operations seem to characterize several of the aid projects.

Problems and Constraints

A variety of problems have been facing Somalia's fisheries development, some attributable to difficult natural conditions, others being of a more technical nature. Many, if not most problems are eventually rooted in the overall structure and organization of the fisheries sector.

A Unique Development Effort: the Fishing Settlements

A unique event took place when 15 000 drought-stricken nomads were resettled to become fishermen in 1975, but so far the overall results of the projects are rather disappointing. In many ways, it provides a typical example of Somalia's fisheries development problems, but also of the potentials.

Conclusion: the Future of Somalia's Fisheries

The fisheries sector continues to receive high priority in Somalia, and there is great potential for expansion, though one must be careful in pinning too high hopes to fisheries in relation to the solution of the country's overall economic problems. Future developments are to a large extent contingent on a structural reorganization of the sector.

1. INTRODUCTION

Somalia emerged as an independent state in 1960 with the reunification of two former colonies, British Simaliland and Somalia Italiana, the latter having been under UN trusteeship since 1950. In 1969 the civilian government was overthrown in a coup led by Major General Mohamed Siad Barre who has been the Head of State ever since. He is also the chairman of the country's only legal party, the Somali Revolutionary Socialist Party, which was established in 1976.

Situated on the northeastern tip of Africa, the Somali Democratic Republic covers a surface of 638 000 km^2 and has a population estimated to be approximately four million. In addition, the country has had to accomodate several hundred thousand refugees in recent years, most allocated in camps and receiving international assistance.

The traditional means of subsistence for the majority of the Somali people has been livestock raising through nomadic pastoralism, and this continues to be the most important sector of the economy. Live animals account for about four/fifth of the total export value.

Only one percent of the land surface is cultivated, though it is estimated that the amount of arable land is 12 times higher. Mineral resources are extremely scarce and the industrial sector represents only a small part of the economy.

Income *per caput* in Somalia is around US$ 185 (1978), putting the country among the 25 poorest in the world (LDC countries). The poor economic performance of Somalia in recent years can partly be attributed to various calamities, such as the 1977-78 war with Ethiopia, the refugee influx and major droughts that have had a particularly damaging effect on the vital livestock sector. On the other hand, massive foreign aid and the unknown, but undoubtly extremely important remittances from the increasing number of Somalis working in rich Middle-Eastern countries, seem to have helped avert a total collapse of the economy.

Despite long traditions, the fisheries sector has never occupied a prominent place in Somalia's economic, social and cultural history. Only a small minority of the population has ever been engaged in fishing, and fishermen have always occupied the lower end of the social status scale. The colonial period brought few changes to the fisheries sector, and it was not until the early 1970's that it began to receive major attention from the local authorities.

2. PHYSICAL SETTING AND RESOURCES

Somalia has the second-longest coastline in Africa, but due to a rather narrow continental shelf, the fish resources per km of coast are moderate. The north coast, facing the Gulf of Aden, extends for about 1 000 km, while the east cost on the open Indian Ocean is more than twice as long. Except for the area around the tip of the Horn of Africa (Ras Asir), where the continental shelf extends for some 40 km or 50 km, most of the shelf is seldom more than 10-15 km wide. The total shelf area (0-200 m) is estimated to be around 52 000 km^2.

The coast is remarkably poorly endowed with natural harbours, and any development of harbour facilities or even simple landing centres are bound to require considerable capital inputs (cf Grinyer and Jones, 1977; WFA 1979). Only three deep water harbours exist at present, Berbera in the north and Mogadishu and Kismayo in the south. The southern shores are partly protected by coral reefs, while the coast itself is characterized by a long sand-dune belt. Along the northeast and north coasts reefs are rare and the landscape is more rugged with high cliffs often plunging straight into the sea. Except for in the very south, there is an almost total absence of islands in Somalia.

Temperatures along the east coast show little seasonal variation, ranging between 27°C and 32°C . On the north coast, however, midday temperatures can reach well above 40 degrees during the hot season. Rainfall is rather erratic throughout the country and mostly concentrated in the two inter-monsoon seasons. Rainfall averages from around 500 mm a year in the south to less than 100 mm in some areas of the north and northeast.

The amount, variety and distribution of marine resources off the Somali coast is to a large extent determined by wind and current conditions. The most important current is the Somali Current which flows southwest during the NE monsoon (November-February) and northeast during the SW monsoon (June-September) as a continuation of the East-African Current. The latter monsoon can produce very strong winds, and the accompanying current may flow as fast as seven knots. Another characteristic of the area is the formation of turbulence and occasional upwellings when the East African and Somali currents run against each other. When this occurs, an abundance of nutrients are swept from the seas bottom to the upper layers. On the other hand, surface temperatures can drop drastically, sometimes to well under 20°C, causing the death of certain species, particularly polyps (cf Currie, Fisher and Hargreawes, 1973).

All in all, however, the local marine conditions seem to have a favourable impact on fish production in the area. Off the north coast, for instance, levels of zooplankton and phytoplankton are said to be comparable to those of the major fishing grounds of the North Sea and Northwest Africa (FAO 1981). Still, information about Somali marine resources is scant and often based on more or less educated guesses.

Only three research vessels have operated to some extent in Somali waters, the R/V ZHELEZNYAKOV (in the period August 1970 to October 1971), the R/V DR FRIDTJOF NANSEN (February 1975 to December 1976) and the R/V ISLA DE LANZAROTE (February 1981 to May 1981). Current resource estimates quoted in most reports (FAO 1978 and 1981; Disney and Edwards 1979; Kollberg 1979; El-Hadary for IFAD 1979: WFA 1979 and 1979a:SRD 1981) are to a large extent based on the results from the first two surveys, the result from the Spanish vessel having been released only recently and not fully analysed yet. Data from both artisanal and industrial fishing in Somalia are both too scarce and unreliable to provide much additional insight into the resource availability, data collecting and statistics being a serious deficiency in the country's fisheries sector.

Following are the current estimates of potential annual catches in Somalia's exclusive economic zone:

Table 1

Annual catch potential (t)

Large pelagic species	8 000
Small pelagic species	100 000
Demersal species	40 000
Sharks and rays	30 000
Lobster (deep water)	1 500
Lobster (shallow water)	500
Shrimps	400
Turtles	not known
Cephalopods	not known
Mesopelagic species	not known

It is here worhtwhile to note that the quantities of certain mesopelagic species are extremely large, resources of lantern fish alone may amount to several million tons (FAO, 1981). The results from the R/V ISLA DE LANZAROTE furthermore suggest that the resources of cuttlefish may be quite substantial (González, 1982). No fishing for cephalopods or mesopelagic species is currently undertaken in Somalia. As far as other species are concerned, only a fraction, usually in the order of 1-20% of the annual potential is currently being exploited. Only the fishing for deep sea lobster has reached the estimated catch potential and may already have been overexploited in some areas.

3. FISHERIES PRODUCTION

An estimated 90 000 people, or roughly 2% of the population are settled along the coast and believed to survive at least partly on fishing. The number of full-time fishermen has been reported at around 4 000 in the last few years, though the number of active fishermen at present is somewhat lower, 2 600 being the most recent (unofficial) figure. As both figures are very tentative, one must be careful not to draw too definite conclusions from them. However, it is probably a correct indication that the total number of artisanal fishermen has been declining in recent years, despite the resettlement of 15 000 nomads to the coast (see relative section).

The large majority of fishermen operate within the artisanal sector, which still accounts for about one third of the total catch (cf. Table 2). Their traditional methods of catch include the use of handlines, troll-lines, cast nets and to a lesser extent beach seines and traps. In the 1970's, particularly during the period of Soviet assistance (1970-77), bottom-set gillnets were distributed in large quantities in most fishing communities.

Traditional boats include the *houri* (a 2-3 m plank boat propelled by paddles or a small lateen sail), the *mashua* (an up to 12 m sailing boat used in the far south) and the *beden* (a 6-10 m sawn (!) plank boat used with oars and sail, mostly in the northeast). They total about 2 250 boats and account for nearly half of the artisanal catch. The use of these boats has been steadily declining, first because of the introduction of motorized GRP boats in the 1970's, later because of the lack of necessary building material to repair the boats and build new ones. This situation is alarming, not only because the craftmanship of the traditional boatbuilders is in danger of being forgotten, but also because the ancient sailing skills are rapidly disappearing while the wind remains free and greatly underutilized.

At the same time, demand for traditional vessels is on the increase as a growing percentage of the GRP fleet is laid up because of various mechanical and supply problems. A total of nearly 700 motorized boats, mostly 6-10 m GRPs, have been issued to fishing cooperatives within the last 10 years, though less than half are believed to be in operational condition and less than a quarter actually operating.

Due to the lack of processing facilities and ice-plants, limited international markets and poor transport facilities, artisanal fishermen not located near Mogadishu or one of the canning factories and more recently, the freezing plant in Kismayo, have had few alternatives when in comes to the marketing of their products. Most fish has traditionally been salted and sun dried, often on the beach, with a rather poor quality product as a result. The decline of the dhow trade has affected the possibilities of marketing dried fish, as have political probems between Somalia and the countries which traditionally bought this product. Market studies (e.g., Husny,1979) indicate that there still should be possible to market dried fish in the Middle-East and Africa, but because of various organizational problems, the situation at present is uncertain at best.

Deep sea fishing is a relatively recent introduction in Somalia and has been characterized by a rather moderate degree of success. Excepting a few Greek trawlers which were operating under licence in the mid-sixties, industrial trawling in Somalia started with the establishment of the Soviet-Somali Joint Stock Fisheries Venture (SOMALFISH) in 1974 with 1 055-m stern-trawlers and a fishmeal factory ship. When Somalia all but broke relations with the Soviet Union in November 1977, expelling all Soviet advisors and technical assistance personnel, the Soviets brought with them all the trawlers after landing the Somali crews. SOMALFISH then continued only as an export agency until it was dissolved in June 1981.

Since the Soviet departure, deep sea fishing has been carried out mostly by a few Italian and Egyptian trawlers operating under licence or in joint venture agreements. Data on the number of trawlers operating in Somali waters and their catches are scarce and largely non-existent, though it seems certain that no more than 10 trawlers have been operating legally at any given time. Somali officials also maintain that a number of foreign vessels are fishing illegally in Somali waters, though the virtual absence of a Somaly coast-guard makes it difficult to assess to what extent this may be the case or to catch any trespassers.

Currently, the Somali Government owns 9 Yugoslav 23-m trawlers and two 28-m Australian trawlers purchased in 1979-80 through various credit and assistance schemes. Due both to technical inadequacies and the lack of trained crews to handle them, none of these boats have been in effective operation yet, though it seems that the Somali Hellenic Shipping Agency will utilize four of them for shrimp fishing off the coast of Kenya.

Two major joint venture projects are currently underway in deep sea fishing, the long-standing Somali-Iraqi company SIADCO, and the more recent Somali-Italian SOMITFISH which includes three 67-m trawlers, four 50-m trawlers in addition to onshore supporting services, including management. The project is financed primarily through an US$ 80 million credit scheme, and two trawlers are already in operation. The SIADCO trawlers, on the other hand, have not been operating at all.

Industrial processing of fish remains a problem in Somalia. The three canning factories in the north (Las Koreh, Habo and Kandala) have operated only sporadically in the last few years with great losses, and none at all are operating at the moment. The same is the case with the only freezing plant in the north, Bolimog. The only bright spot is the National Fish Factory (formerly Prodma) in Kismayo which reopened in December 1980 after having been closed for more than a decade. Still, the moderate production level and the limited expansion possibilities raises questions about the appropriateness of the considerable capital and technical assistance that has gone into the project.

Despite at times considerable investment, foreign assistance and local budget allocations in the fisheries sector over the last decade, improvements in catch figure have been less than impressive. In the artisanal sector, the catch volume is almost half of what it was during the 1975 peak, and the improvement in the industrial sector is to a large extent due to the performance of foreign trawlers fishing under licence though there is no way to be certain about the exact amount as no reliable figures exist. The figures below, especially from 1978 on, are thus based on guesses which are taken to be reasonably realistic and which in any case are the best available figures at the Ministry of Fisheries.

Table 2

Catch figures 1974-81 (in tons)

Sector	1974	1975	1976	1977	1978	1979	1980	1981
Artisanal	3 974	7 900	7 040	5 278	3 584	4 000	4 000	4 100
Industrial	1 350	1 500	3 400	3 400	2 235	3 080	8 530	8 500
Lobster	650	950	950	1 150	20	800	1 800	1 800
Total	6 004	10 350	11 390	9 828	5 839	7 880	14 330	14 400

It is worthwhile to point out here that even the 1980 and 1981 figures represent well under 10% of the total estimated catch potential.

In terms of the national GDP, the fisheries sector makes only a small contribution, less than one percent of the total (1981). The most recent export figures available (1979) show that in terms of Somalia's total export value, fish and fish products represented only one-half of one percent (SDR, 1981).

4. GOVERNMENT POLICIES AND DEVELOPMENT STRATEGIES

With the Five Year Development Programme 1974-78, fisheries appeared for the first time as a separate rubric in Somali development plan, actually listed as a priority sector. The fishery policy objectives of this first FYDP was to develop the sector within the socialist framework outlined in the Second Revolutionary Charter and can be summarized as follows: to maximize the output and gross income of fisheries in order to raise the income levels of the fishermen; create new employment in the fisheries sector; earn more foreign exchange through the expansion of the export of fish products and to encourage increased consumption of fish within the country.

The targets of the plan were highly ambitious, the total production was to increase eight-fold from less than 5 000 t in 1973 to 40 000 t in 1978. Half of it was to be achieved through the establishment of a national trawling fleet with the joint Soviet-Somali venture SOMALFISH, the other half was to be produced by artisanal fishermen.

As indicated in Table 2 above, the fisheries output fell well short of its targets, catches in 1978 actually being a bit lower than in 1974. The low figure was partly attributable to the departure of the Soviets at the end of 1977, though the artisanal sector had also shown a certain decline. Moreover, the rate of project implementations measured in actual expenditures, turned out to be only 50.3% of what was envisioned in the plan (SDR, 1979a).

Still, some significant changes had occurred in the FYDP period. In the artisanal sector, a major event was the creation of 20 fishing cooperatives, following law No. 40 of October 1973. All cooperatives, which in reality were structured as collectives, were issued with motorized boats. By the end of the FYDP, nearly 500 had been issued, a mixture of nine different models with seven different types of engines. Marketing of fish products became heavily centralized, with the Ministry of Fisheries (through SOMALFISH) having almost complete monopoly. Fish prices were standardized weight the fishermen receiving a fixed and relatively low price per kilo caught fish, but also free fuel and gear. This policy has later come under frequent criticism because it is said to provide very little incentive for increased production.

Education was given new emphasis with the building of a new Maritime and Fisheries Institute in Mogadishu, a four-year secondary school which unfortunately become mostly oriented towards navigation and which still provides little and no practical training. On the other hand, the Government campaign to encourage more fish consumption seems to have given some positive results, though the increase in local demand for fish must be seen in light of the drastic increase in meat prices.

A major development in boatbuilding occurred as the Mogadishu boatyard started producing Soviet-type wooden boats with GRP coating, and a new GRP factory was estabished just outside the capital with SIDA assistance.

The emphasis on fisheries in this period was accentuated by the establishment of a separate Ministry of Fisheries with responsibilities for all fisheries resources. Finally, an unexpected, but significant event that took place during the FYDP period was the resettlement of 15 000 drought-stricken nomads into fishing cooperatives.

The Three Year Development Progamme 1979-81 (TYDP) that followed presented few changes in the overall fisheries policies and strategies. Essentially, the policies adopted in the FYDP were reconfirmed and continued Government support granted to activities already initiated. Continued emphasis was given to the promotion of fishing cooperatives and the establishment of joint ventures in deep sea fishing, but little weight was given on evaluating the projects that had already been under way for some time. The TYDP appears to have had an even lower rate of implementation than its predecessor, probably around 30% of the planned expenditures.

Nevertheless, some policy changes in fisheries actually occurred in the TYDP period, partly reflecting the overall shift in Somalia's policy orientation in recent years. Firstly, there has been a gradual liberalization in the trade in fish and fish products, as the dismantelment of SOMALFISH is a reflection of. As a consequence, much of the export is now done through private merchants. Secondly, the Ministry of Fisheries has allowed fishermen in some cooperatives to acquire the cooperative's boats, departing somewhat from the original collective model.

These actual policy changes appear to be further confirmed in the Five Year Development Programme 1982-86 (FYDP 2). During the preparation of this paper (November, 1982), the programme has not yet been officially released, but it is assumed that it will be fairly consistent with the current available draft (SDR,1981). Although the general objectives of the FYDP 2 remain essentially the same as in the two previous programmes, there are some important additions. Specially in the fisheries sector, they include the following changes:

(a) a minimum rather than a fixed price system;

(b) private ownership of vessels and gear;

(c) cessation of gratitious supply of vessels, gear and services to the fishermen;

(d) the rechannelling of a portion of export and royalty generated foreign exchange in the industry for the purchase of desperately needed spares and equipment.

It is here necessary to draw attention to a law introduced in 1979 (SDR, 1979a) which formally legalized the Union of Somali Cooperative Movements (USCM). According to the law, all cooperatives in all sectors have to be members of the Union which is firmly based on the party (SRSP). The objectives of the USCM as far as fishing is concerned seem to be complete collectivization, fixed prices to the fishermen and an incentive system based largely on USCM flags, USCM medals and certificates of honour. This type of policies clearly run counter to those of the Ministry of Fisheries at present, and the potential for future conflicts between the USCM and the Ministry seems great. So far, most of the administration of the cooperatives, including budgets, is still under the control of the Ministry. The USCM has the responsiblility only for certain services and the marketing of dried fish, of which reportedly it managed to export only 100-200 t in 1981.

5. FISHERIES LEGISLATION

As can be expected in a country that less than a decade ago had no fisheries policy at all, fisheries legislation in Somalia is both vague and insufficient for the needs of the industry, on some crucial points it is totally absent (cf. FAO,1978; Christy, 1980). Much of the current legislation is rooted in Somalia's claim on a territorial sea extending 200 miles from the shore but with no principle of delimitation where this gives rise to conflicting claim with neighbouring South Yemen, Djibouti and Kenya. Besides the fact

that such a claim poses difficulties in terms of international acceptability, it implies a great demand on management and enforcement on part of the Somali Government, well beyond the present capabilities. Moreover, as the continental shelf is narrow, and most fishing has to be done fairly close to the coast, the 200-mile territorial limit is of minor interest to the local fisheries.

Fisheries legislation in Somalia is for the most part contained in the Maritime Code of 1959, later amended in 1966 and 1967. Although the Maritime Code provides some articles and provisions specifically for the fisheries, including definitions, concessions for trawling, acquaculture, licences, prohibited fishing methods, etc., they are characterized by their vagueness and potential loopholes.

When it comes to regulations on employment, management, offences, health, statistics, etc., related to the fishing sector, one has to resort to scattered provisions in an array of other civil laws that are often just as vague as the Maritime Code. There is, in other words, a great need for a separate law on fisheries, particularly in view of the likely increase in foreign involvement in Somalia's fisheries. Equally needed is a set of regulations for the management of fisheries.

6. INTERNATIONAL AID

Somalia has long been a major recipient of aid *per caput*, partly because of its status as one of the world's poorest countries, but also because of its geographical position which makes it a country of great strategic importance in the world's power game. Questions have been raised in the past as to what extent aid has been beneficial to Somalia's economic development (Mehmet, 1971) and the issue should be even more relevant today as aid is flowing into the country at an unprecedented rate with comparatively modest results in the overall economic performance (cf. Miller, 1981).

The fisheries sector is no exception. At present, four bilateral organizations (SIDA, JICA, ODA and FRG Aid) are directly involved in fisheries projects in Somalia. In addition, Italy and Yugoslavia have been taking part through major credit schemes. On the multilateral side, UNDP, FAO and the World Bank are supplying aid and services to the fisheries and one might also add WFP as it provides the nomads' fishing settlements with food. In addition, there have been a number of short-term surveys conducted by consultants on various aspects of Somali fisheries. At times, unfortunately, the consultancies have worked on the same topic only a few months apart from each other.

How much financial input that has been made on the various fishery aid schemes over the years, is impossible to assess. Again, the almost total absence of statistics and figures prevents any accurate estimation. To make matters worse, foreign aid contributions to Somalia tend to be immediately converted into shillings in the statistics, thus being mixed with the Goverment inputs. It is in any case certain that considerable amounts have been poured in, an indication of their magnitude may be the estimated costs of the fisheries projects which are currently being implemented or in the pipeline with virtual guarantees of support. These projects alone are expected to receive US$ 110 million in foreign aid, in addition to Som.Sh. 50 million in Government input. Another set of proposed projects with a high probability of receiving aid will cost an additional US$ 80 million plus Som.Sh. 80 million. These are staggering amounts when put in relation to the GDP value generated by Somalia's fisheries sector and which in 1981 was estimated to be Som.Sh. 129 million or about US$ 8.3 million.

The aid to fisheries in recent years has to a large extent been used to cover high capital costs of construction, boats, vehicles, equipment and technical assistance. That not insignificant amounts have gone to waste, can perhaps best be examplified by the fact that less than 50%, perhaps even as little as 25%, of the 685 motorized boats issued to the fishing cooperatives are currently in working condition. One can add other instances of costly capital goods that have been of little or no use, e.g., seven of the nine Yugoslav trawlers, the four SIADCO trawlers, cold storages in the fishing settlements, etc. More worrying perhaps is the lack of monitoring of many aid funds and equipment provided by aid agencies, particularly fishing gear. Despite several millions of dollars worth of gear supplied for the artisanal fisheries in recent years, a large percentage of it has never reached the fishermen.

Another distressing aspect of the aid to fisheries in Somalia is that none of the assistance projects initiated has been or is in the position of being terminated successfully in the sense that it can continue on its own without ouside support. The training element has been sadly lacking in many aid projects, though a great problem also lies in the fact that technicians in particular tend to emigrate to the Middle East as soon as they have received some training, atracted by the high salaries.

A common problem of many aid projects appears to be that they are designed on basis of a very limited first-hand knowledge of the situation. Such knowledge would see to be quite crucial, especially since the Somali data base is so inadequate, and it is doubtful that the necessary insight can be gathered on two-weeks feasibility trips which often cover hundreds if not thousands kilometres of coastline. Moreover, the predominant concern with technology transfer has all but precluded programmes designed to improve and build on existing skills and techniques.

An illustrative example of how hasty surveys can produce erroneous data with potentially serious consequences, is the number of days per year in which fishing is deemed possible because of the constraint the monsoon winds can impose. In most recent reports and project proposals made by international aid agencies, 120-140 fishing days are given as the average potential in the artisanal sector. Data gathered in the four cooperatives for resettled nomads in 1978 and 1979, however, gave an average of 246 actual fishing days, with as much as 318 days in one instance (Haakonsen, 1980). It could here be added that there was nothing exceptional as far as the winds are concerned in the above-mentioned years, and that the resettled nomads are certainly not among the most active fishermen.

7. PROBLEMS AND CONSTRAINTS

More than 60 years ago, an Italian colonial official remarked that whoever thought that, on basis of the abundance of fish in Somali waters, "there is nothing to do but to collect it in quantities to make a profit, would easily encounter failure and delusion" (Vinciguerra, 1919). Indeed, the experiences from recent years have clearly demonstrated that the exploitation of marine resources in Somalia is connected to a variety of problems. For reasons of convenience, they may be divided into three categories: natural obstacles, technical constraints, and organizational problems. Many of the problems are of course interrelated with each other, so these categories are by no means exclusive.

7.1 Natural Obstacles

As pointed out initally, nature has not been kind to Somalia when it comes to natural harbours, and the establishment of even small landing sites and protected anchorages for the artisanal fleet is both difficult and expensive. The narrowness of the continental shelf and the predominantly rocky and coralline bottom puts restrictions on industrial fishing by limiting trawling potential to only a few areas.

It is also unfortunate that some of the richest fishing zones are located outside the most inaccessible areas of the country. The fishing communities there are thus either completely isolated or connected by barely usable roads, and it is difficult to envisage any major improvements of the infrastructure of the northeast in the near future.

The climatic and oceanographic conditions along the coast also pose some problems for a fishing industry. The shifting winds and currents and their often unpredictable effects (e.g., upwellings) result in great variations in the location and composition of resources, not only on a seasonal basis, but also from year to year. High temperatures and humidity additionally require special measures when it comes to preserving and processing the catches.

Some of the problems in fisheries are not so much related to the physical nature of Somalia as to the nature and composition of its population. Having traditionally been a nation of pastoral nomads with some cultivators in the southern interior, only a small minority of the population has ever been directly engaged in fishing. Consequently, there is an overall lack of experience in the country with most aspects of fishing and of the sea, and the limited trade of sea-products in the past means a near absence of

established marketing networks. Moreover, as the case is with many nomadic peoples throughout the world, Somalis in general have shown a traditional distaste for fish and the average person consumes only 0.4 kg of fish/year, the lowest of any country bordering the Indian Ocean.

7.2 Technical Problems

The technical problems can be divided into two types: problems resulting from a lack of basic and necessary equipment and problems caused by the introduction of inappropriate technologies. Particularly the latter category has a wide range of implications.

The first set of problems, lack of equipment, is a difficult one to discuss, as it depends entirely on what criteria one wants to use. It is possible to make an almost endless list of technical equipment lacking in Somalia, from ice-machines and winches to research vessels and computers. It is therefore important to put the needs in relation to existing infrastructure, availability of trained personnel, and appropriateness in terms of capital input required, running expenses and market needs.

Very generally, one can say that there is a lack of basic infrastructure, particularly anything related to preservation and processing of the catch, e.g., ice-machines, cold storages, etc. In addition, there is a lack of adequate workshops for the maintenance and repair of boats and engines, and where such workshops exist, the problem is often unavailability of spare parts. There also seems to be a chronic shortage of fishing gear in most fishing communities, as already mentioned.

This being said, the appropriateness of various technical equipment within the present framework of Somalia's fisheries remains an open question. Much of the technological input in recent years has been useless because the country lacks the necessary personnel to operate, maintain and repair machines and engines and because fishermen have not received the necessary training to utilize modern catch and processing methods.

Another problem, particularly when it comes to motorized boats, has been the failure to provide equipment suitable to the natural conditions of the country or to the fishing methods employed. Thus even properly maintained boats have at times lasted only a few months. The great variety of models introduced, both boats and engines, has not contributed to ease maintenance and repair problems.

Much of the machinery that has been introduced and which continues to be supplied to Somalia's fisheries sector is often decided upon with little or no regard to fuel costs and fuel availability. All petroleum based fuels in Somalia are imported and expensive, and because of the poor accessability to many fishing communities, regular supply of fuel is an enormous problem.

Finally it should be pointed out that too much of the technological innovation that has taken place in recent years has been extremely costly and based solely on imported equipment. Lack of realistic feasibility studies and basic economic calculations have in some cases led to the introduction of sophisticated equipment that cannot possibly pay for its own depreciation and running expenses through production, let alone recover the original capital input. Another disconcerting aspect is the total dependency on foreign manufacturers for future spares and supplies.

7.3 Organizational Problems

Many of the difficulties listed above are to a large extent rooted in organizational problems, as Somalia is still struggling to develop an integrated and economically viable fisheries strategy. One of the most significant obstables to such a strategy is the almost complete lack of reliable data on every level on which to make evaluations, draw experiences, and plan future projects and policies. Moreover, when accurate data are available, there is a severe lack of information flow and exchange, again on every level. This in turns results in lack of coordination in project planning, supply questions, marketing, etc.

Some of these problems are partly attributable to the at times overly bureaucratic structures within the fisheries sector. The system is highly centralized, and even relatively minor issues in a remote cooperative are likely to end up on a ministerial level. Moreover, many such issues have to go through a series of offices and departments represented by an individual rather than an equipe, and if one of these individuals is not in the right spot at the right time, a relatively simple problem may take weeks or months to get resolved.

On the other hand, there is in the Ministry of Fisheries a lack of field-officers permanently stationed in the various fishing districts. This should be a prerequisite in view of the fact that, because of the limited fishing traditions in Somalia, very few ministry officials have much knowledge or experience in fishing (cf. Cole, 1980). First-hand assessment of the local conditions through field officers is thus especially needed.

Lack of any fisheries background among most officials may also account for the over-ambitious production goals in the development plans, though the Ministry of Fisheries is admittedly often encouraged to set such goals by outside agencies (cf. last section). This occasionally leads to hold-ups in project implementations because of excessive costs or the lack of necessary personnel.

By contrast, some projects seem to perpetuate themselves for long periods despite no visible progress and without any attempts to change the course of the projects. In such cases, the problems is often the absence of a procedure to properly evaluate and follow up ongoing projects or it is simply the lack of established auditing and control mechanisms.

The staff problems within the Ministry and other Government organizations in the fisheries sector may finally be attributed to the low salaries to a large extent, a visible problem in all branches of public administration in Somalia. Salaries have remained virtually unchanged for more than twenty years, while inflation has accounted for an increase of the cost of living amounting to several hundred percent. The average monthly salary in the Ministry of Fisheries is between Som.Sh. 500 and Som.Sh. 600 (US$ 33-40) which is far below the minimum required for basic subsistence.

7.4 A Unique Development Effort: the Fishing Settlements

In 1973-74, extensive areas of Somalia were hit by a severe drought that particularly affected the large nomadic population. Hundreds of thousand lost their livestock and were gathered into relief camps where they received basic assistance, but it soon became obvious that many of them would never be able to return to their former pastoral way of life. As a consequence, the Government initiated a massive resettlement operation involving 110 000 of the drought-stricken nomads; 15 000 of them were brought to the coast to form three, later four, fishing settlements, an operation actually unprecedented in history.

This resettlement scheme is not only interesting in its uniqueness, it also reflects most of the problems that are currently facing Somalia's fisheries. It provides typical examples of the difficulties involved in the overall fisheries organization, production, marketing technology transfer, consumption, etc. But most importantly, it can serve as an extremely valuable base of experience for the country's future fisheries development, especially since this programme has been under more scrutiny at various stages than any other fisheries project in Somalia (cf. Barkhadle, 1977, 1977a, 1977b; Haakonsen, 1979 and 1980; Larsson and Akerman, 1980; Murdoch and Mohamed 1980; SDR, 1976; WFA, 1981; WFP *et al.*, 1980).

Seven years have past since the settlements were established and it is quite clear that they are a long way from achieving their original goal of self-sufficiency. In fact, the settlers are still completely dependent on food rations and other assistance from the Government, production is low, many of the adult men are missing from the settlements (though a not insignificant number have been drafted into the army), and although there have been a number of technical and supply problems (break-down of engines, lack of fuel), the settlements as a whole have been operating well below their capacity.

Have the nomads been unable to adapt to their new life as settled fishermen? This is a hypothesis frequently advanced and based on the common belief that nomads in general are too deeply entrenched in their life-style to settle down permanently and that a transition from pastoralism to fishing is a particularly difficult one. However, documented instances of such a transition in other parts of the world, e.g., the Baluchis of Pakistan (Pastner, 1980) and the Turkana of Kenya (Broch-Due and Storaas, 1981; Jul-Larsen, 1981), indicate that there is little or no evidence to support such a claim.

The same seems to be the case with the fishing settlements in Somalia. The problems that exist are for the most part rooted in structural and organization difficulties of the kind described in the previous section. This was already apparent at the planning stage where no real assessment was made of the insfrastructural needs and costs or the feasibility of having more than 5 000 people in one spot make a living out of artisanal fishing. The structure of the settlements, based on a complete collectivization of the fishermen with minimal individual responsibilities and incentives, is probably also to blame for the rather disappointing performance of the settlements.

Table 3

Catch figures in the settlements 1978-81 (in kg)

Settlement	1978	1979	1980	1981
Brava	122 281	120 048	102 382	96 956
El Ahmed	67 604	83 663	117 476	178 527
Adale	215 496	147 560	216 497	n.a.
Eyl	212 203	260 256	577 254	n.a.
Total	617 584	611 527	1 013 609	n.a.

The figures may perhaps not seem completely discouraging at first sight (though there is reason to question their reliability), but it must be remembered that the catches are supposed to sustain 15 000 people. Moreover, the running costs in the settlements are extremely high, and since most of the catch is processed into low value dried fish, the overall losses have been quite substantial over the years. For instance, in an analysis of the 1980 catches, it was found that when taking into account the production costs alone, the losses of dried fish sales per kilo of wet fish ranged from a low of Som.Sh. 1.65 per kg in Eyl to a high of Som.Sh. 7.15 in Brava (WFA, 1981).

At the moment the future of the fishing settlements looks uncertain at best, particularly since no major structural changes are envisioned. The potential that some of the settlers may eventually make an independent living out of fishing is certainly still there, but prospects are becoming increasingly dim as time goes on. After seven years of abundant food rations, guaranteed minimum salaries, free boats and fishing gear as well as substantial free social services, the settlers have become so deeply entrenched in a dependency situation that it is likely to prove very difficult for them to come out of it.

8. CONCLUSION: THE FUTURE OF SOMALIA'S FISHERIES

Fisheries are to continue to receive high priority from Somali authorities in the next few years. This is clearly reflected in the draft of the new FYDP (1982-86) which proposes a Government input of Som.Sh. 388 million in the fisheries sector, or 2.4% of the total development expenditures, twice as much as the health sector, for instance.

Major policy changes are envisaged, some being already apparent, as pointed out in a previous section. The expansion of the trawling fleet is to a large extent occurring through private interest from abroad, and much of the fisheries trade is already conducted

by private merchants. However, the perhaps singlemost important change proposed in the FYDP 2, namely "the reorganization of the present institutional set up" (SDR, 1981), is not clearly defined and certainly not yet under way.

Some of the current policy objectives continue to seem overly optimistic if not unrealistic. The trawling fleet is expected to expand to 20 vessels by 1986, but even if this target is reached, there are questions about the appropriateness and profitability of Somalia having such a relatively large fleet. Firstly, because of the limited trawlable areas, and secondly, because of the lack of onshore facilities and the near absence of local crews for the trawlers.

Employment in the artisanal sector is also given high priority, but the goal of dubbling employment in fisheries by 1986 outlined in the FYDP 2, seems overly ambitious. Again, the Somali Government's ability to make realistic forecasts has not been helped by predictions presented by certain aid missions. A recent World Bank report (1981), for instance, envisions an absolute increase of six to eight times in the portion of Somalia's pupulation to be economically dependent on fishing by the year 2 000, which is simply absurd.

On the other hand there are indications that the objectives and predictions in fisheries are gradually being adjusted to realistic levels. Following are the latest production estimates for the next few years currently available at the Ministry of Fisheries.

Table 3

Estimated catches 1982-86 (in tons)

Sector	1982	1983	1984	1985	1986
Artisanal	4 100	5 000	7 500	9 600	9 600
Industrial	8 500	15 000	20 000	25 000	30 000
Lobster	1 800	1 800	2 000	2 000	2 000
Total	14 400	21 800	29 500	36 600	41 600

It should be noted here that while the plans of both the Government and aid agencies call for massive investments in the fisheries sector, there is a comparatively little emphasis on the economic vialibility of the various projects. There also seems to be a continued tendency to plan and set objectives on basis of the total potential catch figures without fully assessing the actual composition of the resources and the difficulties that may be involved in exploiting them and bringing the products to market.

The possibilities of integrating traditional structures and techniques of Somali fishermen into proposed development projects are an issue that continues to receive only minimal attention , if any. In this connection one could also mention the total lack of any concrete proposals for closer links and cooperation with other developing countries, whether within the framework of TCDC or in terms of common regional strategies.

Many of the problems connected to the current and future development of Somalia's fisheries are eventually rooted in the inadequate knowledge of the existing conditions and the absence of a reliable data-collecting structure. It may therefore be more useful in the long run to focus on these aspects first in order to pave the way for more realistic and appropriate approaches in development projects and a true reorganization of the fisheries sector as a whole.

Somalia's fisheries have beyond doubt the potential for considerable expansion and increased production. With the possible exception of deep sea lobster, over-exploitation of resources will not be an issue within the foreseeable future, an enviable situation

for a coastal nation in today's work. It would be a fallacy, however, to expect Somalia's fishery sector to be able to make more than a relatively minor contribution towards solving the country's economic and employment problems, as many local and international officials seem to believe.

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FISHERIES STRATEGIES AND POLICIES IN SRI LANKA
CASE STUDY

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Colombo, Sri Lanka

ABSTRACT

There was very little State assistance to the fishing industry during colonial rule and the development of Sri Lanka's fishing industry was actively promoted by the State only after 1948 when Sri Lanka gained political independence. Today, fisheries is an important economic activity of the Island in terms of supply of animal protein, provision of employment opportunities and earning of foreign exchange. In recent times the Government has invested increasing amounts of capital to develop the industry.

Sri Lanka's production of fish has increased from 42 000 t in 1950 to 203 000 t by 1981. The Island's production of fish comes mainly from the coastal inshore fisheries carried out within the narrow continental shelf. The exploitation of offshore and deep sea resources is quite negligible. By 1981, inland fisheries contributed close to 30 000 t which is about 15% of total production.

The increase in production during the past three decades has been mainly due to mechanization of traditional craft, introduction of new craft, introduction of new types of gear and fishing methods. Now Sri Lanka has over 28 000 fishing craft out of which 12 000 are mechanized.

Since 1948 successive Governments have endeavoured to increase production of fish by upgrading the artisanal fishery and small-scale fishery by the introduction and mechanization of larger and modern vessels as well as by expanding inland fisheries.

Subsidies, hire purchase and other soft credit schemes have been important features in the efforts to upgrade the artisanal fishery, and the development of the small-scale fishery subsidy was the major factor responsible for the success of the mechanization programme and issue of new boats. However, in the past few years, the subsidy has been used for other purposes such as the popularization of sails, issue of traditional non-mechanized craft for marine and inland fisheries, development of fish farming, etc.

Liberal credit schemes have helped the small-scale fishermen in no small measure. Poor loan recoveries have been one major problem and the grant of loans, which was done by the Department of Fisheries from the inception of the schemes, has been taken over by the State banks. Though the situation has improved, a closer rapport between lender and borrower is necessary.

Cooperatives have been most important among the small-scale fishermen but not all societies were viable and well managed.

In 1979 the Government launched a Master Plan for Fisheries Development. Objectives of the Plan are to increase production of fish and *per caput* consumption, raise the standard of living of the fishermen and increase employment in fisheries. The more important policies and strategies set out in the Master Plan are: (a) that the private sector will play a major role while the State sector will concentrate on providing infrastructure and incentives; (b) the coastal fishery is given highest priority and the development of the fishery will take place exclusively through small-scale fishermen; (c) offshore fisheries will be developed through local companies; (d) deep sea fisheries will be developed through joint ventures and foreign collaboration; (e) inland fisheries will be accorded greater emphasis; and (f) programmes that will directly improve the quality of life of the fishermen, such as housing construction, provision of drinking water, etc., will be implemented.

Under the Master Plan impressive increases in production, employment, boat issues, and improvements in infrastructure and welfare facilities have taken place. The open economic policies of the Government have removed shortages of vital inputs such as engines, spare parts and gear, while the new incentives for investment have resulted in the setting up of ice plants, workshops and boatyards.

Sri Lanka has received external assistance to develop the industry through foreign governments, international aid agencies and regional banks. This includes surveys of marine resources, construction of harbour and infrastructure facilities, introduction of larger vessels and fishing methods, inland fisheries development, training of fishermen and upgrading of technology.

In 1976 Sri Lanka declared an Exclusive Economic Zone. However, exploitation of resources in the extended areas of jurisdiction has not been possible due to lack of technology and expertise. Modest beginnings have been in the exploitation of offshore resources through two foreign-funded projects. However, deep sea resources remain unexploited. Attempts made to attract foreign investors in deep sea fishing, particularly tuna fishing, have not met with success.

The rise in the price of petroleum has affected the mechanized fishing industry's viability. To overcome this, the Government has taken measures such as the promotion of sails and the use of other fuel-saving devices. Inland fisheries has also been given high priority in view of its potential to make cheap protein available to the population.

Sri Lanka has used a major part of foreign assistance for fisheries to import expertise and technology. Now it is appreciated that technology and expertise available in the region itself would be more useful, particularly in the exploitation of its EEZ resources, in aquaculture and fishing technology.

1. PAST, PRESENT AND PROSPECTIVE SITUATION OF FISHERIES IN SRI LANKA

1.1 Introduction

Sri Lanka is situated in the Indian Ocean, southeast of India and lies within the latitude 6^{o}–10^{o}N, and longitude 80^{o}–82^{o}E. The Island has a land area of 65 000 km², a coastline of 1 200 km and a shelf area (up to 120 m depth) of 30 000 km². With the declaration of the Exclusive Economic Zone in 1976, Sri Lanka has sovereign rights over an area of about 230 000 km² of the sea.

Fishing has been an important occupation in the coastal area of Sri Lanka from time immemorial. Fishing takes place around the island and is concentrated within the continental shelf which is an area generally within 20 mi of the coast and averaging about 14 mi in width. Waters within the Exclusive Economic Zone (200 mi from coast) represent the principal resources open for exploitation by Sri Lankan fishermen. Access to a part of the Pedro Bank is also available. Inland fishing is done in freshwater tanks and reservoirs, in brackishwater lagoons and estuaries, in freshwater ponds and in mangrove swamps.

1.2 Historical Sketch

During the period of colonial domination the importance of pearl, chank and window pane oyster fisheries as a source of state revenue seemed to have attracted the interests of the colonial rulers. The food fishery was generally neglected. However, by the second decade of the 20th century, a change of attitude on the part of the Government became evident. A number of measures were initiated to develop the food fishery referred to as the "ordinary fishing industry" in the Government Report 1915. These measures included the appointment of a Marine Biologist, conducting of marine resources surveys and a series of trawling operations using mechanized vessels.

Universal franchise and limited self-government were granted in 1931 under the Donoughmore Constitution. With this change in the political structure, a serious attempt was made to develop the fishing industry. The subject of fisheries was assigned to the Executive Committee/Ministry of Health and Local Government. From the point of view of development and management of fisheries the enactment of the Fisheries Ordinance in 1939, the establishment of the Advisory Committee on Fisheries in the early 1940's and the establishment of the Department of Fisheries in 1946 can be considered landmarks. With the onset of World War II the importance of the fishing industry was enhanced due to curtailment of imports of fish products. The Government promoted the setting up of cooperative societies for marketing of fish. It also initiated schemes of assistance to help the fisherfolk such as the establishment of special stores which sold important requirements such as fishing gear, salt, provison, etc.

During the 34-year period since political independence was gained in 1948, the industry has progressed to be an important sector in the economy of the island. The most important developments that took place during this period include the mechanization of the fishing fleet, the use of improved and new gears and methods of fishing, the designing, development and the use of new and improved types of fishing craft, the establishment of a separate Ministry of Fisheries and the consequent strengthening of the institutional structure to assist and support the fishing industry. Several schemes of state assistance and incentives for the development of the industry, such as capital cost subsidies, soft term credit and tax incentives to promote investment, have been implemented. In addition, considerable expenditures have been incurred by government on the improvement of infrastructure facilities and the establishment of fisheries training programme. Furthermore, this period witnessed the utilization of foreign assistance of a high magnitude. Consequently the production of fish in the island increased during this period from a level of 42 330 t in 1950 to 200 000 t in 1981.

1.3 The Contribution of the Fishing Industry to the Economy

The fishing industry in Sri Lanka has a relatively high importance in the economy compared to many countries in the region. The value added each year to the Gross Domestic Product by the fisheries sector in 1977, 1978, 1979, 1980 and 1981, at constant prices (1975) was as follows:

Year	Total GDP (Cey.Rs. M)	Fisheries contribution (Cey.Rs. M)	Percent
1977	29 319.6	407.8	1.39
1978	32 068.5	452.9	1.41
1979	33 987.5	485.6	1.43
1980	35 926.1	428.4	1.47
1981	37 805.7	601.8	1.59

The industry supplies a very substantial proportion of the animal protein consumed by the population of Sri Lanka. In 1979 and 1980, the fisheries sector contributions in this regard were 60.6 and 61.3% respectively. *Per caput* consumption of fish and fish products in Sri Lanka has varied from 11.16 kg to 14.85 kg during the past decade.

The industry provides direct employment to about 74 000 persons in fishing and to about 14 000 persons in related ancilliary occupations such as marketing, distribution and processing of fish, boat-building, manufacture of nets, operation of ice plants, and provision of other infrastructure facilities.

In recent times, the fisheries sector has developed to be an important source of foreign exchange earnings. In the years 1978, 1979, 1980 and 1981 the value of exports from the fisheries sector amounted to Cey.Rs. 233 million, Cey.Rs. 307 million, Cey.Rs. 240 million and Cey.Rs. 348 million, respectively. This is around 1.5 to 2.0% of the country's total export earnings during these years.

In recent times the fisheries sector has been assigned a relatively high priority in the National Development Programmes of Sri Lanka. This is reflected by the substantial increases in the Capital Expenditure allocations for Fisheries Development in the Annual Budgets. The details are:

		Cey.Rs. M
1977	-	47.53
1978	-	116.79
1979	-	111.91
1980	-	236.45
1981	-	200.41
1982	-	174.13

1.4 Fisheries Resources

1.4.1 The marine fisheries

For convenience, the marine fisheries will be considered under two sub-sectors - the coastal fishery, and the offshore and deep sea fishery.

(a) The Coastal Fishery

This is the fishery carried on in the area of the sea extending up to 25 mi from the coast. On the basis of resource surveys carried out in the past, the estimates of annual sustainable yields range from 250 000 t to as much as 850 000 t. Surveys conducted by the Norwegian Research vessel DR FRIDTJOF NANSEN in 1978, 1979 and 1980, estimated the total biomass of Sri Lanka's coastal shelf and immediately adjacent area at 750 000 t. The annual sustainable yield is estimated to be about 250 000 t of which about 80 000 t represent large demersal and semi-demersal fish.

(b) The Offshore and Deep Sea Fisheries

The offshore fishery is the fishery in the area between 25 and 60 mi from the coast while the deep sea fishery is in the area beyond 60 mi from the coast. The resources in the offshore and deep sea are yellowfin and bigeye tuna, and species such as skipjack, marlin, swordfish and shark. The magnitude of these resources is not accurately known but an annual sustainable yield of 29 000 t has been estimated. Current annual production, however, is a little over 2 000 t.

1.4.2 Inland fisheries

The Inland Fisheries include over 300 000 ac of brackishwater estuaries and lagoons and 344 000 ac of man-made freshwater reservoirs and irrigation tanks. The latter comprises the major reservoirs and tanks, 175 000 ac in extent, which usually carry water all the year round and seasonal tanks, 169 000 ac in extent. Present production in the inland fisheries is estimated at around 29 000 t.

1.5 Fishing Craft and Methods

At the beginning of 1982 it was estimated that there were approximately 28 500 fishing craft of different types operating in the Sri Lankan Fishery. Of these 15 800 were non-mechanized traditional craft while the rest were mechanized traditional craft or new mechanized craft. These were:

- Non-mechanized traditional craft

Planked	-	3 521
Outriggers	-	5 598
Dugouts	-	230
Log rafts	-	4 951
Beach seine craft	-	1 461

- Inboard mechanized craft - 3 915

- Outboard mechanized craft - 8 808

Total 28 484

The major fishing method used is drift netting while beach seining, trawling, trolling, handling, longlining, pole-and-lining are also practised. In recent times attempts have been made to popularize the use of bottom longlining and bottom set gillnets.

1.6 Fish Production and Utilization

There has been a considerable increase in fish production in the country in the past three decades as could be seen from the following:

Year	Fish Production (t)
1950	42 330
1955	38 810
1960	52 180
1965	92 740

Year	Fish Production (t)
1970	96 608
1975	127 106
1980	184 722
1981	203 586

This production increase was substantially due to the state programmes for the mechanization of traditional craft, the introduction of new mechanized boats, and the popularization of new and more efficient fishing gear and methods.

It is estimated that nearly 85% of the fish produced in Sri Lanka is consumed in the wet form while a substantial proportion of the balance is converted to dried fish. Very little processing and freezing of fish is done at present, this being limited to prawns, lobsters and other species such as cuttlefish and squid which are mainly exported.

With the liberalization of the imports in 1977, the imports of fish and fish products have been substantial. Of these imports, tinned fish rank first in terms of quantity and value, followed by imports of dried fish.

Fish production, imports and exports and the availability of fish for local consumption during the last few years are indicated below:

Year	Production (t)	Imports[a/] (t)	Exports[a/] (t)	Fish supply (t) (2+3-4)	*Per caput* consumption (lb)
1977	136 578	9 143	3 059	142 665	22.92
1978	153 121	8 617	4 542	158 196	24.98
1979	165 723	25 414	6 228	184 909	28.62
1980	184 782	34 253	3 542	215 433	32.74
1981	203 586	10 749	4 394	209 941	31.38

a/ Wet equivalent

1.7 Marketing Distribution and Physical Infrastructure

Marketing of fish in Sri Lanka is predominantly handled by the private sector. Most traders have close ties with the boat owners/fishermen and make their purchases at the beaches. The fish is then packed in ice and transported by lorry or rail to consumer centres, sometimes as much as 200 mi away. Substantial quantities of fish are brought to the wholesale fish market in Colombo where it is sold by commission agents. The other major fish markets are in Kandy, Jaffna, Galle and Trincomalee. A number of producer fishery cooperative societies have also set up their own marketing and distributing activities.

The Ceylon Fisheries Corporation is also actively engaged in the marketing and distribution of fish. The Corporation has fish purchasing centres in important fish producing areas and has its own retail shops, a number of cold rooms, fish on ice stores and its own fleet of refrigerated and insulated trucks as well as open trucks. The Corporation maintains a buffer stock of fish in order to stabilize fish prices to the benefit of both the consumers and the producers.

Over 90% of the 28 500 boats (15 800 non-mechanized) in the marine fisheries operate from open beaches with the smaller boats being hauled up the beach while the bigger boats are anchored in sheltered bays, estuaries, channels, etc. The Ceylon Fishery Harbours

Corporation operates and maintains eight fisheries harbours of which three are capable of accommodating large ocean going vessels. In the harbours as well as in other strategic producer and consumer centres are located 64 ice plants and a few freezing and storage units. The whole island is covered with a network of metalled and tarred roads while rail routes cover many of the important producer and consumer areas facilitating quick transport of fish. Slipways and repair facilities are available in the harbours operated by the Ceylon Fishery Harbours Corporation while a large number of private owned workshops scattered throughout the coast, and boatyards undertake repair and maintenance of boats and engines.

1.8 Organization and Institutional Arrangements

Promotion, development and management of the fisheries in Sri Lanka is the responsibility of the Ministry of Fisheries. This Ministry which is under a Cabinet Minister is headed by a Secretary and has a number of divisions responsible for specific subjects such as marine fisheries, inland fisheries, fisheries training and education, fishermen's welfare, planning and programming and development and implementation of projects, etc. The Ministry has field officers located in the coastal districts as well as in the major inland fishing areas. Their primary functions relate to the enforcement of fisheries laws and regulations, collection of statistics, fisheries extension and welfare work.

The Ministry also has three autonomous agencies for carrying out certain other functions. The National Aquatic Resources Agency undertakes research on resources, methods of exploitation and post harvest technology. The other agencies are The Ceylon Fisheries Corporation which is engaged in marketing and distribution of fish, and the Ceylon Fishery Harbours Corporation which handles the construction, operation and maintenance of fisheries harbours.

2. ASSESSMENT OF PAST/PRESENT POLICIES

Since independence (1948) all governments have been concerned with increasing fish production, employment, incomes and foreign exchange earnings through investments in fisheries. With change of governments there were no radical changes in regard to these basic objectives; although there were changes in the priorities assigned among these objectives, as well as changes in policies and strategies.

In regard to fish production reliance was placed on (1) upgrading the productive capacity of the artisanal fishery by modernization of fishing craft and introduction of new fishing gear and methods; (2) introduction of large and modern fishing vessels with a view to establishing an industrial fishery for exploitation of deep sea resources and (3) expansion of the inland fishery.

Strategies for increasing productive capacity emphasized support and assistance for state sector investments during certain periods, while during other periods private sector effort was encouraged. At times major reliance was placed on cooperative effort and cooperative ownership of boats, while at other times, the role of the cooperatives as owners of fishing craft was de-emphasized and individual ownership was encouraged with the cooperatives primarily providing services to individual boat owners. Inputs to the fishing industry were at times severely restricted and import and distribution of fishing gear were the monopoly of a state agency. Other inputs such as marine engines, raw materials for boat-building, etc., were also permitted only through import controls or foreign exchange quotas. With the change of Government in 1977 imports were liberalized and adequate quantities of foreign exchange were made available for imports.

In recent years the Government has accorded a high priority to the development of the country's small-scale fisheries in view of its contribution to fish production, provision of increased employment opportunities, potential for foreign exchange earnings while at the same time action programmes have been launched to improve the quality of life of the small-scale fishermen. State sector investment in capital intensive and advanced technology industrialized fishing was de-emphasized. As an alternative private sector investment with foreign collaboration for exploitation of the offshore and deep sea resources is now favoured with an offer of tax incentives.

Subsidies and hire purchase schemes have been an important feature in Sri Lanka's post-independence efforts at fisheries development. There were necessitated by the fact that the bulk of the fishermen could not on their own, bear the cost of the initial investment on craft and gear and the operational risks. In recent years the producer subsidy became a pre-requisite for the introduction of new boats in view of the cost increases in engines, boats and gear. Providing this subsidy is one of the major strategies in the boat issue programme of the five year Master Plan (1979-83) for further development of the country's fisheries. Since the mid-seventies the capital cost subsidy on the issues of mechanized boats has been 35% of the cost of the hull, engines and gear, while on the issue of inboard and outboard engines it has been 50% of the costs.

The producer subsidy is presently used as a means of intervention for the promotion of fuel economy measures such as the use of engines of low horsepower, sails, etc. Fishermen who wish to replace their traditional craft or to purchase a new craft of the same type are eligible for a state subsidy of 90% of the total costs. Inland fishermen too are now granted a 90% subsidy on the purchase of small non-mechanized craft and gear. Subsidies are also used to promote fish farming which has not been a traditional activity in Sri Lanka and as much needs to be made attractive to investors.

Subsidy payments made by the Government since 1970/81 were as follows:

	Cey.Rs. M
1970/71	1.49
1971/72	-
1973	0.90
1974	0.24
1975	1.16
1976	3.41
1977	3.95
1978	15.56
1979	38.80
1980	57.47
1981	36.06

Subsidies are the major factor responsible for the success of the mechanization programme and the current inland fisheries programme. Taking into consideration the nature of the fish resources in the country, the technological state of development of the fishery including the lack of a strong entrepreneurial class, the strategy to increase fish production through mechanized small craft operated by small-scale fishermen appears to have been the best in terms of achieving the stated objectives of production, employment and incomes.

Fisheries Cooperatives were first established in Sri Lanka in the late 1940's mainly for marketing and distribution of fish and by 1970 there were about 280 small primary societies. These were amalgamated into 45 large primaries. These were the organizations through which the government's fisheries development efforts were chanelled during the period 1970-1977. Issues of mechanized boats on hire purchase terms at the early stage of the implementation of the mechanization programme were limited to cooperatives. Later, with the introduction of the producer subsidy, cooperatives were entitled to a higher subsidy of 50% of costs as compared with the 35% subsidy granted to individuals. However, the cooperatives did not live up to their expectations and most cooperatives were not viable.

Since the country achieved political independence provision of credit to fishermen on soft terms has been one of the important strategies in development of fisheries. Credit was initially chanelled through fishery cooperative societies for purchase of craft and gear. Subsequently this concession was extended to individuals too. However, repayments of loans were not satisfactory and it became clear that it was not prudent for the Department of Fisheries which was handling fisheries credit to continue to function as a credit agency.

A policy decision was taken in 1981 to channel fisheries loans exclusively through the State Banks. Since then there has been a reduction in the default rates. With proper rapport being established between the banks and the fishermen the default rates will drop further. The Asian Development Bank financed South West Coast Fishery Development Project has proved this.

Sri Lanka has to depend on imports of marine engines, fishing gear, fibreglass and resins for its boat introduction programme. Due to severe foreign exchange difficulties, commencing in the 1960's and continuing up to 1977 all imported inputs were on import quotas and subject to exchange controls. The result was that the needs of the industry were not adequately met. This was highlighted by an FAO Programme's study conducted in 1978 as being the major constraint to the development of the industry.

From 1965 to 1977, the Ceylon Fisheries Corporation had the monopoly of importing and distributing fishing gear. Due to various reasons adequate supplies were not available during this period. Most of the fishing vessels therefore carried less than the required complement of fishing gear. The FAO/BOBP study referred to above, estimated losses in production on this account to be nearly 54 000 t of fish a year.

A major change in policy was made in 1977 with liberalization of imports. The monopoly of the Ceylon Fisheries Corporation to import and distribute fishing gear was done away with, resulting in a number of importers entering the business. Competition ensured availability and better prices. The import values of fishing nets imported since 1970 were as follows:

	Cey.Rs. M	
1970	3.48	
1971	0.92	
1972	1.80	
1973	2.37	
1974	8.45	
1975	2.67	
1976	6.47	
1977	11.82	
1978	35.71	) Major increase in imports
1979	38.15	) mainly to clear backlog
1980	21.11	
1981	10.84	

In addition, the local capacity for the manufacture of fishing nets was stepped up after 1977 through new investments. At present there are four fishing net factories in the country with a total capacity to produce about 480 t of fishing nets. This would meet nearly 90-95% of the country's requirements. Production is however, short of theoretical capacity and meets about 50% of the country's requirements.

Similarly, engines, spares and raw materials for boat building were under import quotas throughout the period 1970-1977. It was reported in 1976 that as a result of the non-availability of engine spares, annual production losses were in the region of 10 000 t of fish and that these shortages had particularly affected the production of the cooperative boats. This situation improved with liberalization of imports in late 1977. Marine engines are now freely available with better after sales service and additional workshops have been set up.

Inadequate capacity in boat building was another factor that hindered the boat issue programme in the early 1970's. As a result of the Government's new investment policy this problem was resolved with the increase in the number of boatyards from 43 in 1976 to 62 in 1981. The new boatyards were set up mostly in the major fish producing areas which permitted closer liaison between the client and the boatbuilder and also cut down the cost of transport.

As indicated earlier, attempts were made to introduce large fishing vessels and establish industrialized fishing in Sri Lanka. Government carried out trawling operations with large modern vessels in the 1950's. These operations provided useful resource information and generated interest in industrialized fishing in the private sector. However, the few companies which operated large trawlers did not find the operations viable the reasons being lack of expertise, lack of skilled personnel and to a great extent, lack of knowledge of resources. With the setting up of the Ceylon Fisheries Corporation in 1964, plans were formulated to exploit offshore and deep sea resources using large ocean going trawlers and tuna longliners. The ambitious plans for expanding the fishing fleet and increasing fish production did not materialize, due mainly to inefficiencies in management and lack of expertise. In 1977 policy on state sector involvement in fishing was changed and emphasis placed on promotion of local private sector investment in deep sea fishing. Several proposals for collaboration on joint ventures or on other commercial arrangements had been forthcoming, although nothing has been finalized as yet. One problem appears to be that the type of activity in deep sea tuna fishing which was identified as the most suitable for such collaboration seems to attract only a few collaborators. On the other hand foreign promoters with idle capacity in trawling, consequent to declaration of EEZs and restriction of fishing operations have proposed several arrangements which involve use of trawlers. Unfortunately, the trawlable grounds within Sri Lanka's EEZ are limited and most of them are in areas reserved for fishing operations by small-scale fishermen. In regard to offshore resources exploitation, the policy has been to promote local private sector participation in projects financed by Aid Agencies, like the Asian Development Bank and the Abu Dhabi Fund. Several medium-sized vessels have been introduced under these aid projects and since high technology and major upgrading of skills are not required, local private sector fishing ventures have met with fair success.

In the inland sub-sector attempts at utilization of the inland water bodies of Sri Lanka for harvesting of fish commenced in the 1960's with the establishment of a series of inland fisheries stations at selected locations in the country. These stations at which fish breeding facilities were also available, were to act as the centres through which fish fingerlings were to be distributed for stocking of water bodies. Information on harvesting techniques was also to be disseminated among the population around the water bodies. However, production from the inland fisheries fell far short of the potential due to several reasons among which are lack of tradition, expertise in inland fish production, market constraints and inadequacy of government allocations in the national budget. Since 1979, development of the inland fisheries has been actively encouraged with generous subsidies, soft term credit and a major promotional effort in the areas of fishing, fish culture and pond culture. Processing, marketing and distribution of inland fish were also not neglected. A major expansion in this sub-sector is planned. It would be observed that though the plans appear ambitious, the success hitherto achieved gives promise of a substantial contribution from the inland fishery to fish production in Sri Lanka.

The Government which came to power in 1977, formulated a Master Plan for fisheries development for implementation during 1979-82. The basic objectives of the Plan are: (i) to step up the production of fish and to raise annual *per caput* consumption to 44 lb; (ii) to raise the incomes and standards of living of the fishermen and (iii) to maximize employment opportunities in the fisheries sector.

The more important policies and strategies in the Master Plan are as follows:

(i) the private sector was expected to play a major role in the development of the fisheries sector;

(ii) the state sector's role was to be limited to the provision of infrastructure and institutional support, and incentives and subsidies for investment;

(iii) the improvement of the quality of life of the fishermen was given high priority by the provision of basic facilities and amenities for living;

(iv) the development of the coastal fishery was to be given the highest priority. This sub-sector was to be reserved for the local fishermen, preference being given to small-scale operators;

(v) high priority was to be accorded to the development of the inland fisheries sub-sector where a major production increase was planned;

(vi) the development of the offshore fisheries was to be promoted through local companies or individuals, and financed mainly through foreign aided projects;

(vii) deep sea fishing was to be promoted mainly with foreign collaboration.

The implementation of the Master Plan commenced in 1979. A salient feature of the Plan has been that while its basic framework has remained unchanged. Various adjustments in projects and programmes have been effected taking into consideration the changed circumstances and needs. Production of fish, though still short of the target set out in the Plan, has increased by 49 500 t during the three years, i.e., from 154 000 t in 1979 to 203 600 t in 1981. In the coastal fisheries the increase has been 12 650 t. The sub-sectors in which production has been stagnant are the offshore and the deep sea areas where production has remained at around 2 000 t.

In the coastal sector the production increase has been largely due to the large number of new mechanized boats issued and the traditional boats mechanized. The mechanization programme has been promoted and supported by the subsidy scheme and the bank credit scheme. Under these schemes, the purchasers of boats are eligible for a 35% subsidy on the total cost of the hull, engine and gear, while the state banks extend credit up to 88% of the cost less subsidy. The number of mechanized boats, inboard and outboard engines/motors issued under these schemes during the period 1979-81 has been as follows:

Year	3 1/2 t boats	17 1/2 ft boats	Inboard engines	Outboard motors
1979	292	418	41	3 157
1980	537	1 520	62	1 637
1981	350	692	12	850
Total	1 179	2 630	115	5 644

It is not prudent to rely solely on increased issue of boats and engines for production increases in the coastal fishery in the future since fuel price hikes have adversely affected production, in that boat operators have reduced the number of fishing days to those days in which they expect good catches. Other measures have to be taken so that there is no reduction in the number of fishing days.

The increased production in the inland fisheries is due mainly to the increased allocations in the government budgets and the very special efforts made in expansion of the capture and culture fisheries in the inland waters of Sri Lanka since 1979. Mention has already been made of the generous subsidies and credit terms extended to this sub-sector. The allocation for inland fisheries in the last four years were as follows:

	Cey.Rs. M
1979 -	4 610
1980 -	14 800
1981 -	31 795
1982 -	16 000

In the offshore fisheries, initial steps toward exploitation of its resources, were taken in 1978 with the introduction of thirty 38 ft vessels as a component under the ADB financed first fisheries development project. Poor maintenance and repairs of these vessels were a major reason for the rather disappointing results. However, it must be

maintained that this was a pioneering effort fraught with various problems connected with vessel designs and management of this class of vessels. Eighty vessels of about the same size are being introduced under the Abu Dhabi funded project. Initial results are encouraging, and since lessons learnt from the experience of the first ADB project in regard to boat design, as well as operation and maintenance, are applied to the Abu Dhabi project, the future for offshore fishing operations show promise.

As indicated earlier, the proposal for deep sea operations have still not got off the ground. If foreign collaboration is not forthcoming, it may be necessary for Sri Lanka to defer proposals for exploitation of deep sea resources or as an alternative go it alone after careful consideration of the technical and commercial viability of deep sea fishing operations. In the latter case it would be necessary to obtain financing - at least the foreign exchange cost - from multilateral or bilateral aid sources. Local private sector involvement supported by local financial institutions would also be necessary.

From time immemorial there were conflicts among the different users of the coastal fishery. Mechanization of craft and introduction of new and improved gear and methods, have led to a transition from a traditional subsistence level artisanal fisheries to more commercialized type of fishing. This has led to changes in the nature and scope of the conflicts in this fishery. The earlier methods of settlement of conflicts backed by customs and usage were no longer adequate. New arbitration and settlement procedures to meet the changed situation had to be worked out. With increasing numbers of small mechanized craft fishing with gillnets, there arose conflicts between the operators of these craft and beach seines operators. There were also conflicts between operators of traditional vessels and fishermen using mechanized vessels, both of whom often exploit resources in the same area. Gillnetting for tuna came into conflict with pole-and-lining for tuna in the same inshore area. Another cause of conflict has been the use of highly efficient methods such as purse seining in areas where gillnetting is the major method of fishing. Migrant fishing in the marine and inland sector have led to rather serious conflicts between the migrant fishermen and permanent resident fishermen. In all these cases arbitration and settlement procedures have been worked out within the framework of the Fisheries Ordinance. In addition, small-scale coastal fishermen have been confronted with two other problems emanating from extraneous sources. Firstly, there is poaching carried out by foreign vessels in inshore waters. The Government of Sri Lanka has enacted the Regulations of Foreign Fishing Boats (Act) No. 59 of 1979 to protect the interests of the local fishermen. However, due to the lack of proper surveillance and monitoring capacity it has not been possible to control these illegal activities altogether. Secondly, the development of the tourist industry has also brought in its wake difficulties for the fishermen in that some of the beaches which were earlier used for beaching of boats, mending of nets and drying of fish were generally taken over by some of the tourist industry developers. The institutional mechanisms for settlement of such problems have been worked out and adverse effects on the fishing industry minimized.

In Sri Lanka's coastal fishery, gillnetting is the most important method of fishing. It is estimated that gillnetting is carried out by at least 60% of the total fishing fleet and that it accounts for over 70% of the total production of fish. Fishing craft now operate with a higher complement of gillnets than what was used seven to eight years back. There is a belief that over the years catch per unit effort in gillnetting at least on the West Coast of the island has decreased indicating a situation of overexploitation of the inshore small pelagic resources. Although there is no conclusive evidence to support this, it is thought necessary to diversify the methods of fishing used by the coastal small-scale operators. According to resource surveys conducted by the Norwegian Research Vessel DR FRIDTJOF NANSEN in 1978, 1979 and 1980, the annual potential yield of demersal fish could be over 70 000 to 80 000 t. There is very little exploitation of this fish and Sri Lanka has made a start at increasing the exploitation of underexploited demersal fish by methods such as bottom longlines and bottom set nets. The FAO/SIDA Bay of Bengal has actively supported Sri Lanka's efforts at diversifying fisheries by undertaking fishing trials and demonstrations to exploit demersal fish. A number of fishermen on the West Coast have now taken to bottom longlining as a major method of fishing.

Increased employment has been provided consequent to development policies pursued in the coastal fisheries in recent times. It can be estimated that at least 12 000 additional hands would have obtained direct employment in fishing with the issue of mechanized boats

in the coastal fishery and non-mechanized boats in all inland fishery during the period 1977-81. To this must be added the large numbers who would have obtained indirect employment in the building of boats, operation of ice plants and fish net factories, and in processing, distribution, transport and marketing of fish.

3. EXTERNAL ASSISTANCE IN SRI LANKA FISHERIES DEVELOPMENT

The Sri Lanka fishery has been a beneficiary of programmes of assistance extended to it by foreign governments, international agencies and regional development banks since the 1950's.

It is with the mechanization programme that international assistance started flowing into Sri Lanka's fishery. The Government of Canada assisted with gifts of engines and FAO by provision of technical expertise, etc., provided active support to the mechanization programme. These efforts were met with initial resistance from the fishermen. However, success in terms of increased catches and earnings led to the acceleration of mechanization of craft in Sri Lanka.

The Canadian Government in the early fifties also provided a gift of a fishing harbour in Mutwal consisting of a breakwater, a pier, a workshop and a cold room. These were the first modern infrastructure facilities to be established in the country.

The Government of Japan which was interested in the development of the Sri Lankan fisheries provided assistance to set up a training centre in Negombo in 1962. This was followed up with assistance for training of Sri Lankan fisheries personnel at Fisheries Training Institutions in Japan and later with the setting up of three other Fisheries Training Centres in Sri Lanka at Batticaloa, Tangalle and Jaffna. The Sri Lanka Fisheries Training Institute in Colombo was also established with Japanese assistance in 1976 to train operators for deep sea fisheries and was equipped with the necessary training equipment vessels and personnel. In 1979 the Japanese Government also donated two modern vessels with Japanese experts for training in tuna longlining and gillnetting. Japanese assistance for training has had a very positive impact on the industry in that new methods of fishing in the use of gear as well as the knowledge for upkeep and proper maintenance of engines were provided to the fisheries through these programmes.

In the early seventies, FAO with UNDP assistance carried out a survey to identify resources of live bait for skipjack pole-and-line fishing. Later this project was expanded to cover exploratory studies of tuna and small pelagic varieties and purse-seining with small boats. In the 1970's the FAO's Inland Ocean Programme provided a number of development support measures. Since 1978 this work has been continued by the SIDA/FAO Small Scale Fisheries Development Programme. In the seventies there were a number of marine surveys conducted by foreign agencies among them are the offshore trawling survey conducted by the Soviet R/V OPTIMIST and the three surveys were conducted by the Norwegian vessel DR FRIDTJOF NANSEN. These surveys proved very helpful in planning the exploitation of marine resources. Sri Lanka on her own could not have carried out these surveys due to both lack of funds, equipment and expertise.

Since the mid-seventies Sri Lanka has received assistance from a number of bilateral agencies and the regional bank for fisheries development projects, involving the issue of craft, establishment of marketing and infrastructure facilities and technical inputs. The first major development project was the South West Coast Fisheries Development Project funded by the Asian Development Bank. This project was Sri Lanka's pioneering attempts at the development of offshore fisheries exploitation. Largely due to the technical defects associated with the 38 ft vessels introduced for offshore fishing, their performance was below expectation. However, this project has had a positive impact because of the experience gained by the implementing and executing agencies as well as private operators of these vessels which will prove useful in the new projects which are now under implementation. The other major development projects now under implementation are the North West Fisheries Development Project assisted by the Abu Dhabi Fund, the East Coast Project funded by the Dutch Government, UNDP/FAO Aquaculture Training and Development Project and the West Coast Fisheries Project funded by the Asian Development Bank. Aid from these agencies have been made available to the Government of Sri Lanka on soft terms with grant components,

long repayment periods in grace periods and on low rates of interest. Disbursement of credit to beneficiaries have been channelled through Government or the State Banks with terms being liberal in regard to interest rate, period of repayment and requirements of collateral. During implementation the projects are jointly monitored, evaluated and reviewed by the donor agency and implementing/executing agencies with necessary remedial action being taken to ensure maximization of project benefits. One of the noteworthy features regarding these three projects is the flexibility which enable the nature and the scale of the components to be varied taking into consideration the changing needs and circumstances.

Sri Lanka's efforts to develop inland fisheries aquaculture have also been supported by international agencies. The Chinese Government set up a carp breeding station at Udawalawe and provided technical training for local personnel for the running of this station. IDRC of Canada has supported a project to study the applicability and feasibility of cage culture practices in Sri Lanka. An FAO/UNDP project of three years duration started in 1981 is now under implementation and under this a seasonal tank development programme as well as the training of aquaculture and extension workers are being carried out. The Asian Development Bank will also assist the Government of Sri Lanka in the development of aquaculture under a project now being prepared. All these projects are designed to provide expertise in the field of inland fisheries and aquaculture which has been the most important reason for the slow growth of this sector until recent times.

Fish marketing and post harvest technology is another important area in which Sri Lanka has benefitted through external financing. This assistance came with the establishment of the Institute of Fish Technology funded by SIDA and executed by FAO.

There is not the slightest doubt that Sri Lanka fishery has benefitted greatly by these assistance programmes. Without this assistance Sri Lanka could not have implemented most of the larger projects in view of the non-availability of foreign exchange resources which account for a considerable proportion of the total costs. Furthermore, these programmes of external assistance have also made it possible to use technical expertise which is today quite costly. As a result of the periodic monitoring and review procedures generally insisted upon by the donors the quality of projects have tendered to improve while permitting flexibility which are necessary to meet changed circumstances and needs. It should be mentioned that while certain procurement procedures still continue to be biased in favour of donor countries this has not created any major difficulties for Sri Lanka. However, it would be useful to give a greater degree of discretion to the user in the selection of consultants. Some donor agencies/countries still continue to have a bias in favour of foreign personnel as against the local experts and this has sometimes led to unfortunate results.

It is heartening to note that certain agencies have realized the merits of appointing local experts to responsible positions in implementation of projects. This will immensely benefit the countries receiving aids since it will help to build-up the nucleus of local expertise for project implementation.

4. THE CHANGED FISHERIES SITUATION IN SRI LANKA

With the declaration of the 200-mi Exclusive Economic Zone in 1976 Sri Lanka has sovereign rights over an area which is roughly five times the land area of the country. This has provided Sri Lanka with an unprecedented opportunity to reap the benefits of the resources in this area. It may be noted however, that while Sri Lanka obtained jurisdiction of an extended area of the sea it suffered the loss of two very productive areas of fishing, namely the Wadge Bank and a part of Pedro Bank consequent to the Indo-Sri Lanka Maritime Agreement signed in 1976. These losses are significant because Sri Lankan craft were fishing in these grounds for a considerable time and a wealth of resource data had been accumulated over the years.

The Master Plan for Fisheries Development targetted for an increase in the production of fish from the offshore and deep sea areas by 34 300 t of fish in the Plan period. Out of this 34 300 t, almost 25 800 t were to be achieved through the implementation of foreign funded projects, viz., the ADB funded South West Coast Fisheries Project, the Abu Dhabi funded North West Coast Fisheries Development Project, and the second ADB funded West Coast

Project. The balance 8 500 t were to be contributed by a high seas tuna longlining project and by the use of a number of large boats of 38-65 ft long. However, like most developing coastal states Sri Lanka has not been able to obtain maximum benefits of the resources within the EEZ due to a number of constraints the more important among them being the lack of reliable resource data, lack of expertise and technology and the lack of capital and vessels required for the exploitation of deep sea resources.

These foreign funded projects which aimed at exploiting offshore resources had to be scaled down from the original levels resulting in the issues of a much reduced number of boats. This was mainly due to the very substantial cost escalations which have taken place in the past 5 years in the capital cost of boats. Furthermore the development of the proposed large 38-65 ft vessels for offshore and deep sea exploitation by the Cey-Nor Development Foundation have not materialized due to fears that the high cost of fuel might affect viability of operations.

The Master Plan also makes it clear that foreign investment in deep sea fish resource exploitation would be welcome. Endeavours have been made to create an environment which could motivate foreign fishing companies to participate in deep sea fishing on mutually beneficial terms. Up to now there has not been any major investments in deep sea fishing. Sri Lanka will also consider licensing of foreign vessels to fish in her waters on the payment of fees and royalties. Though a large number of parties were interested, most proposals were not in line with Government's policy of safeguarding the rights of the local fishermen and could not be accepted. This has already been referred to on page 8, para. 3.

The other great challenge that Sri Lanka fishery has had to face in recent times is the energy crisis. In a situation where a very substantial part of the fleet is mechanized and such mechanized boats make a significant contribution to the total production of fish in the country, the cost escalations resulting from the energy crisis have thrown the industry into disarray. Other than operational costs (fuel and lubricants) capital costs of boats (hull, engines, fishing gear) of boats have gone up. The fuel price hike has affected all types of mechanized boats in Sri Lanka, 3 1/2 t inboard engined boats as well as the traditional craft powered by outboard engines. A comparison of the capital and operating costs of the 3 1/2 tonner and the FRP boats before and after the increase in fuel prices are indicated on page 16.

To sustain investments in fishing vessels, the Government of Sri Lanka has during the past few years offered generous subsidies to the purchasers of vessels and gear. This has helped to cushion the impact of the increased capital and operational costs consequent to fuel price hikes. There is however a limit to the financial allocations the Government could make to the provision of such direct assistance to cushion the effect of cost escalations. Therefore a number of other measures have been taken by the Government to reduce expenditures on fuel. This includes the promotion of the use of sails and other fuel saving devices as well as encouragement of the use of engines of a lower horsepower than are presently fitted to fishing boats. In 1979 the Government extended its capital cost subsidy to sails and in 1981 small traditional craft with sails were given a subsidy of as much as 90%. Another noteworthy development is the programme to retrofit bigger mechanized craft with sails. The mechanized 34-ft vessels issued under the Abu Dhabi Project and the mechanized 24-ft vessels issued under the East Coast Project have sails fitted on them for auxiliary power of the refitting 1 500 existing 3 1/2 t vessels with sails under the second ADB project with a view to fuel economy. The FAO/SIDA Bay of Bengal Programme has also been demonstrating by operating specially designed vessels in Sri Lanka. In addition USAID financed project is underway to train youth in the art of sailing, using five modified 3 1/2 t mechanized boats.

Sri Lanka's population increased from 12 690 million in 1971 to 14 850 million in 1981. During this period, with the several programmes of development in the agricultural sector, there had been an increase in rural incomes with a consequent increase in the demand for fish in the rural areas, particularly in the wet form. In this connexion it is relevant to mention that certain changes occurred in regard to supplies of dried fish which was a popular item of the diet in the hinterland. In the sixties, Sri Lanka's imports of dried fish constituted about 50% of the total fish supplies. Due to scarcities of foreign exchange in the early seventies imports of dried fish were drastically curtailed.

Capital and Operating Costs

(per craft)

	3 1/2 t boats		18 ft FRP boats	
	1977 Cey.Rs.	1981 Cey.Rs.	1977 Cey.Rs.	1981 Cey.Rs.
1. Capital Costs				
Hull	18 923	57 500	7 600	17 800
Engine	32 000	79 470	4 944	10 500
Fishing gear	25 000	60 000	15 000	15 000
Total	75 923	196 970	27 544	43 300
Less 35% subsidy	26 573	68 940	3 124	15 155
	49 350	128 030	24 350	28 145
2. Operating Costs[a/]				
Fuel	10 600	54 000	4 176	21 216
Oil	145	660	90	340
Food for crew	4 000	8 000	2 000	4 000
Repair and maintenance	3 796	29 848	1 377	2 165
Replacement of fishing gear	8 333	20 000	5 000	4 000
Incidental	2 000	5 000	1 000	2 500
Total	28 874	97 508	13 643	35 221
3. Depreciation				
Hull	1 261	3 833	1 086	2 543
Engine	4 571	11 353	1 236	2 625
Total	5 832	15 186	2 322	5 168
4. Loan Repayment				
Loan Instalment	9 870	10 483	-	6 192
Interest	2 739	7 740		8 165
Total	12 609	18 123		8 165
5. Total Costs				
(3 + 3 + 4)	47 315	130 817	15 965	64 519

a/ Excluding crew share which is normally 50% of the value of catch less operating expenses on fuel, oil and food

Even though foreign exchange was available for imports in the late seventies and the early eighties supplies from traditional sources were limited. Sri Lanka therefore had to meet the demand for fish by increasing production and supplying it in wet form. During the late seventies Sri Lanka launched several major multipurpose projects including the major Mahaweli River Diversion Project. These projects increased supplies of water to the existing water bodies and expanded the inland water areas. Major settlement programmes were also undertaken under these projects. The higher priority given to the development of the inland fisheries was in response to the need to utilize this new resource and to make available supplies of cheap protein to the increasing population particularly those in the rural areas.

5. OPTIONS FOR FISHERIES DEVELOPMENT STRATEGIES, ETC.

The coastal fishery is of prime importance on account of its resources, its present contribution to fish production and the potential for expansion. The issue is whether further expansion of the coastal fishery should be undertaken using small-scale fishermen and the type of craft and gear they are capable of handling or whether large and modern trawlers, purse-seiners, etc., that is, larger craft and gear using advanced technology should be used with a view to setting up an industrialized fishery which possibly could exploit resources more efficiently.

From very early times there has been a fair portion of the population settled round the coast. Most of these settlers were engaged in subsistence level fishing. Subsequently, with the growth of commerce, trade and other industrial activities some of these settlers originally engaged in fishing took up new pursuits. However, the majority of those settled around the coast continued to be dependent for their livelihood on fishing. If there is a change from small-scale fishing to industrialized fishing, since fewer persons would be required for the more capital intensive industrialized fishing vessels, it would be necessary to resettle these persons living around the coast in other areas, e.g., in the hinterland for agriculture or find other alternative sources of employment in the coastal areas. Due to pressures of population, etc., there are limits to the country's capacity to resettle such people in the hinterland or absorb them in alternative employment. Furthermore, such resettlement would require a long period of readjustment together with heavy allocations of government expenditures.

Before one chooses for capital intensive and technically advanced options such as industrialized fishing on the grounds of efficiency it would be necessary to ascertain whether a small-scale approach using traditional fishermen cannot give the same results, namely, maximum utilization of coastal fish resources. It is believed that the utilization of small-scale fishermen supported by appropriate development in craft, gear and methods could effectively lead to the achievement of the objectives of maximizing production. Furthermore, it has been estimated that such a strategy would not only provide employment and income to settlers around the coast but also that it would be of low cost option, particularly from the point of view of foreign exchange expenditures. Therefore, Sri Lanka has opted for further development of the coastal fisheries through small-scale efforts, and to this extent discouraged in this area, the type of fishing activity generally associated with large-scale industrial fisheries. This is the policy which is not likely to be changed in the near future.

The offshore fisheries are presently exploited by a few vessels of sizes ranging from 30 ft to 50 ft. These include about five 40 ft to 50 ft trawlers operated by the Cey-Nor Development Foundation and thirty 38-ft gillnet longliners introduced under the first Asian Development Bank, South West Coast Project. Success was limited in view of problems of management, boat design as well as maintenance and repairs. In any case it was evident that it is possible for local entrepreneurs when some of the problems indicated above are solved, to successfully exploit the resources in the offshore areas. Under the Abu Dhabi funded North West Coast Project, 90 gillnet longliners and trawlers are being introduced for expansion of fishing in the offshore areas. Initial results have been encouraging and this pioneering effort by Sri Lanka to expand into the offshore fisheries will be watched with interest. In this area too since it is believed that Sri Lanka has the capacity to effectively exploit resources, foreign investment and participation is not actively encouraged. However, foreign collaboration with local partners having the major share in the enterprise may have to be considered if it is proved that the solely Sri Lankan effort is not going to meet with success.

The deep sea fisheries are hardly exploited at present. In the past, certain efforts were made by the Ceylon Fisheries Corporation to exploit these resources using large trawlers and longliners. Although there was some success in the initial years, problems relating to management, lack of expertise, maintenance and repair, including age of vessels and obsolescence, have led to the virtual stoppage of deep sea fishing by state organizations.

Consequently, Sri Lanka has decided to attract foreign investment either by direct investment by fishing on licence, by collaboration with local investors through joint ventures or through other commercial arrangements, etc. However, as indicated on page10,para.1, very little progress has been achieved. This was due to the fact that it was not possible to reach complementary interests. For example, most of these proposals envisaged the utilization of foreign trawler fleets with an excess capacity arising from the changed situation consequent to the new Law of the Sea. The other issue on which agreement could not be reached was the quantity that would be exported and the quantity that would be supplied to the domestic market. Although foreign exchange earnings are of importance, Sri Lanka does not wish to sacrifice supplies of fish to the domestic market, particularly supplies of those varieties of fish which are popular among the consumers in Sri Lanka. Export of such varieties would have serious implications in terms of protein supply and cause considerable hardship to local consumers.

Sri Lanka actively encourages foreign investment in the exploitation of pelagic species particularly the tuna varieties. It, therefore, proposed foreign collaboration in tuna longlining. However, due to problems connected with operational costs due to fuel price escalation, as well as wages escalation and loss in revenues due to fall in market prices and possibly fall in catch rates in the area, the response to Sri Lanka's invitation to collaborate in the exploitation of tuna has been poor.

If Sri Lanka is unable to attract foreign investment in the exploitation of deep sea resources, it may be necessary for Sri Lanka to consider doing it alone. This would have to be done only after a careful assessment of the risks involved and preferably with local private entrepreneurs involvement. Since the local private sector will not be able to mobilize adequate funds, obtaining funds from the international market or through bilateral and multilateral aid is envisaged. Here again, local private sector participation with borrowings from the international market would be preferable to state involvement backed by foreign aid on soft terms.

The development of Inland Fisheries is considered to be vitally important to Sri Lanka due to the many advantages it has. Firstly, in the present context of high energy costs, inland fisheries both in the Capture Fishery where sails and rowing is resorted to instead of engines, as well as in the Culture Fishery there is little expenditure of fossil fuels. Inland fisheries also provide supplementary employment and incomes to those primarily engaged in agriculture and to many fishermen in the off-season. A major expansion in irrigation and hydro power is now under way and the potential for inland fish production is rapidly increasing. Culture of high value species for export does not come into conflict with supplies to the local market.

However, Sri Lanka has many problems to overcome. These include the lack of a tradition in fish culture and consumer resistance to inland fish as well as low prices. The strategy Sri Lanka has developed to overcome these problems include upgrading of skills of fishfarmers with extension work carried out by local and foreign exports, the provision of processing facilities to enhance the quality of the product and a major promotional programme to make inland fish farming attractive and increase consumer acceptability. It is believed that production from the inland fisheries which has been rising steeply in recent years, will soon make a significant contribution to protein supplies, particularly in the rural areas.

In regard to the package of subsidies and incentives which has been offered for development of the different sectors, details have been furnished earlier. It would be observed that in the development of the coastal area, major reliance has been placed on short-term credit, particularly where development effort is by small-scale fishermen. It is suggested that in areas necessitating high risk pioneering efforts such as development of the offshore fisheries, there should be an increase in the quantum of subsidy, say from 35% to 50%,

to compensate for the risks. Such an increased subsidy is already operating in the inland fisheries area. (Cooperatives operating in the coastal and offshore fisheries already obtain 50% subsidy of capital costs.) Capital allowance (or lump sum depreciation) has been done away with recently. Such tax concessions should be permitted for a longer period in the high risk unexploited areas. In the deep sea fisheries it is observed that on collaboration could not sometime be reached with foreign partners on matters such as equity (between local partners and foreign partners) and the share of the catch that should be permitted for local consumption. Although these are not the reasons why foreign investments did not materialize, it is suggested that some flexibility on these matters, particularly the share of the catch that should be transferred to the domestic market is required. Deep sea resources are presently unexploited and the transfer of the catch (which would otherwise not be available for local consumption) to the foreign markets is justifiable.

In the small-scale sector, individual ownership and entrepreneurship as well as organization of production effort through cooperatives is actively encouraged by government. No change in this is recommended. In the offshore and deep sea sectors, the present policy is to encourage private individual entrepreneurship, organizations of fishing companies and collaboration between local fishing companies and foreign companies. Purely state sector investment with the allocation of government funds together with aid from foreign agencies with repayment guaranteed by the state is discouraged with a few exceptions, these being those where private sector response and interest are lacking.

The role of the state sector is presently defined primarily as the provider of infrastructure support to fishing operators and assistance support to fishing, marketing and distribution. Some state sector intervention in marketing is also envisaged. The earlier monopolist position of the state sector in offshore fishing and deep sea operations as well as in the provision of vital inputs such as fishing gear has been done away with in keeping with the liberal economic policy of the present government.

One of the stated objectives in the Master Plan is the improvement of the quality of life of the small-scale fishermen. Although the small-scale fishermen make a significant contribution to the productive effort (over 90% of the fish production comes from the small-scale sector) they did not have access to basic amenities of decent living such as housing, health and sanitation, education, potable water, etc. These small-scale fishermen are among the least favoured groups in Sri Lanka. In implementing the Master Plan a very special emphasis has been placed on executing several programmes directed towards improvement in the quality of life of the small-scale fishermen. The programme undertaken include construction of permanent houses for fishermen, construction of roads, wells and latrines, establishment of community centres, etc. Institutional and other measures were also taken to coordinate the provision of services by government Departments and Corporations concerned with health, education transport and postal communications. For this purpose Fisheries Extension Service Centres were established to complement and supplement the efforts of the fishery cooperatives which were generally concerned with production. Special measures are also being taken to prevent loss of life and equipment by the provision of a coordinated Air-Sea rescue service, while a compulsory insurance scheme to covery injury and loss of life of the crew as well as losses to craft and gear, is also in force.

Recently Sri Lanka has placed special emphasis on regional development, in that financial provision for development as well as planning and implementation of regional development projects is undertaken on a regional basis. Government allocations for such regional programmes have accordingly been made through decentralized budgets. Furthermore, integrated rural development projects financially supported by multilateral and bilateral aid agencies have been undertaken in several selected districts such as Puttalam, Matara, Hambantota and Matale. These projects contain several components aimed at the improvement of the quality of life of the rural population including fishermen. These integrated projects meet the special needs of the selected rural areas and cover development fields which were not covered by national programmes mainly due to funding constraints.

6. TECHNICAL COOPERATION NEEDS AND POSSIBILITIES OF REGIONAL COLLABORATION

As indicated in Section 3 above Sri Lanka has benefitted considerably from foreign assistance programmes in the planning and implementation of fisheries development projects. Countries such as Sri Lanka have used a substantial part of the foreign assistance they have received to obtain foreign expertise and technology. Traditionally these technical skills and expertise have been obtained from developed countries and it is now increasingly recognized in Sri Lanka that the import of technology from advanced countries do not create the desired development due to several reasons. This is true of the fisheries sector as well. Until recent times countries such as Sri Lanka little appreciated the possibility of obtaining the expertise from our neighbours or from our region. A survey of the fisheries situation in the Indo-Pacific Region or more specifically in the Bay of Bengal area reveals that the needs problems and constraints in these countries are similar and closer cooperation on a regional basis would be mutually beneficial to the countries concerned.

Sri Lanka for some time has had arrangements under which it was possible to obtain from our neighbours the technology, skills and expertise in some areas of the important sectors in the economy. The Indo-Sri Lanka Economic Agreement which has enabled Sri Lanka to obtain assistance from India by way of expertise on brackishwater fishfarming is a good example of this. Similarly we have agreements with some other countries in our region and attempts will be made to utilize the experiences and available knowledge in these countries on specific areas of fishing.

In considering our strategy to develop our coastal fishery further one of our priority areas in which we would benefit by cooperating with countries in our region are the diversification of our fishing methods, the introduction of cheaper and more efficient methods of gear, introduction cost effective and successful schemes of statistical collection and stock assessment used in the region.

In the area of offshore and deep sea fisheries exploitation our main concern would be with obtaining resource data from some of the countries in our region which have been fishing in our seas prior to the declaration of Exclusive Economic Zones. The experience of countries in the region which successfully developed their deep sea fisheries especially the tuna fisheries on the basis of foreign collaboration would also be useful in formulating on our policies and enforcement systems. There is also the possibility of concluding umbrella agreements with some of the Asian countries under which fishing companies in the two countries could establish joint fishing ventures using Sri Lanka's unexploited fish resources and infrastructure facilities and the unutilized vessels of the other countries. A very fertile area for regional cooperation would be monitoring surveillance and control of foreign fishing in the EEZ in which Sri Lanka, India, Bangladesh and the other countries of the region could at least initially exchange information regarding illegal fishing conducted in each others waters.

It is in inland fisheries and aquaculture that Sri Lanka could benefit most through technical cooperation with the countries in the region who have had a tradition of fishfarming. In fact, Sri Lanka has had the benefit of utilizing expertise from India and Thailand in aquaculture in recent times. Extension of this cooperation would be of extreme value to Sri Lanka.

The activities of the FAO in the Indian Ocean particularly in the Bay of Bengal area has brought Sri Lanka closer to our neighbours in the field of fisheries. The SIDA/FAO Bay of Bengal Programme has played a catalystic role in bringing at closer cooperation between Sri Lanka, India, Bangladesh, Malaysia and Thailand. The Programme Secretariat keeps the member countries in touch with one another and in addition the Annual Advisory Committee of the Programme provides an opportunity to discuss common problems and attempt to look for mutual acceptable solutions for regional problems. The recently inaugurated Bay of Bengal Committee of the IOFC further strengthens the existing bonds. The new UNDP supported project "The Project for the Marine Resource Management in the Bay of Bengal" which will be the technical supporting unit of the Committee will undertake activities with a view to assist the member countries to exploit areas now available to them under the new region of the sea and help resolve any problems relating to management of common stocks.

Technical cooperation among developing countries (TCDC) is a concept which has now found wide recognition as an arrangement with great potential to help countries such as Sri Lanka obtain more acceptable,useful and cost effective technology and expertise from within the region itself.

Sri Lanka has supported this institutional arrangement and is keen to participate in TCDC Projects. Areas in which Sri Lanka would benefit from such participation are:

1. Development of new and suitable fishing methods to diversify the existing coastal fishery largely based on gillnetting.

2. Development of cheaper and more efficient types of vessels and gear.

3. Cost effective schemes of fisheries statistical collection and stock assessment.

4. Exploitation of deep sea fish resources particularly with foreign collaboration.

5. Cost effective monitoring, surveillance and control systems.

6. Aquaculture.

Sri Lanka could through TCDC arrangements be of assistance to countries in the region in the area of fibreglass boatbuilding, training of small-scale fishing operators and fish processing.

However, at a time formal TCDC arrangements have come to stay, the procedures and mechanisms connected with such arrangements should be flexible so that unnecessary procedural snags will not delay such projects and nullify the objectives.

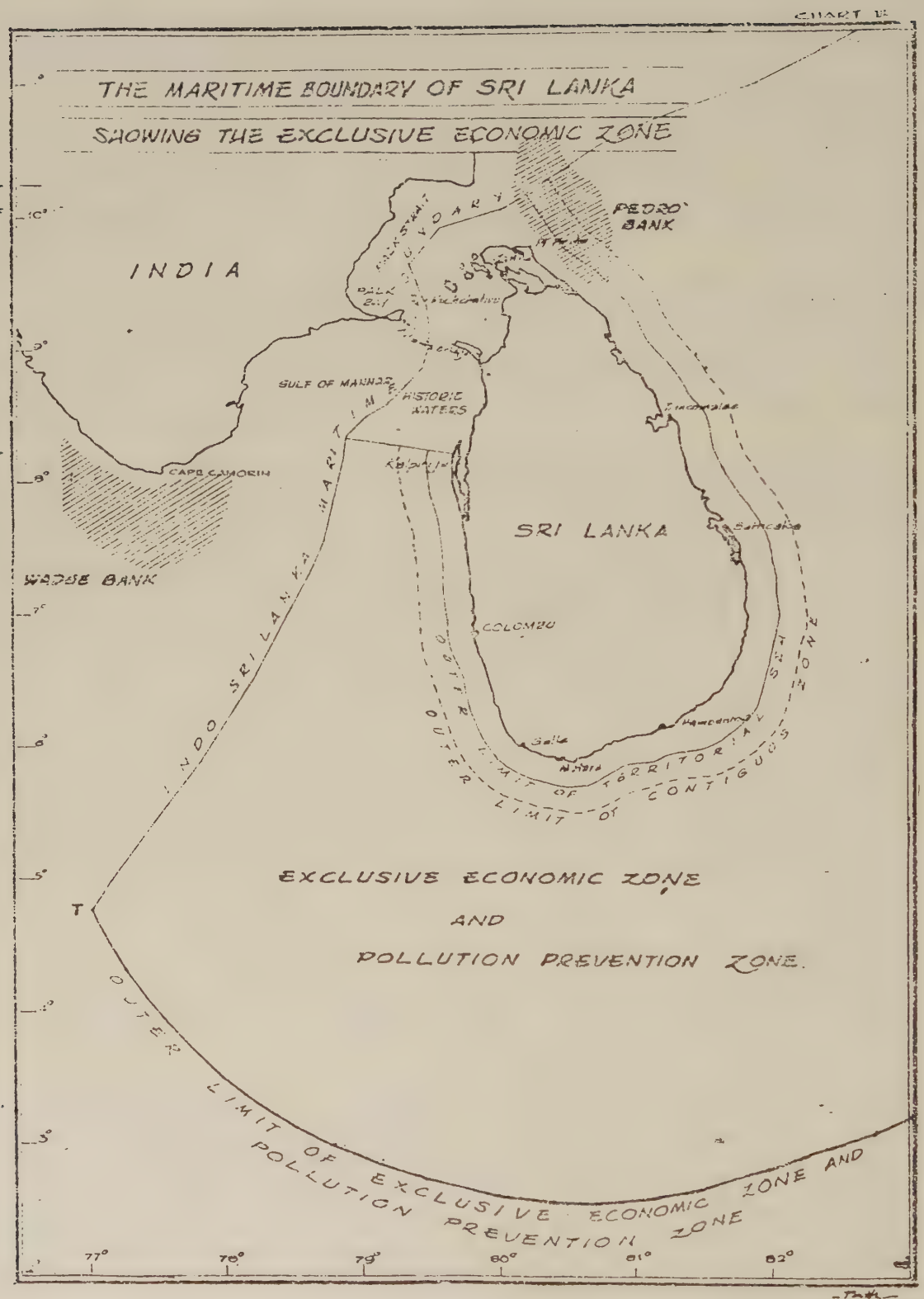
CHART II
THE MARITIME BOUNDARY OF SRI LANKA
SHOWING THE EXCLUSIVE ECONOMIC ZONE
INDIA
PEDRO BANK
PALK STRAIT
PALK BAY
GULF OF MANNAR
HISTORIC WATERS
CAPE COMORIN
WADGE BANK
SRI LANKA
COLOMBO
Galle
Hambantota
Batticaloa
Trincomalee
Kankesanturai
INDO SRI LANKA MARITIME BOUNDARY
OUTER LIMIT OF TERRITORIAL SEA
OUTER LIMIT OF CONTIGUOUS ZONE
EXCLUSIVE ECONOMIC ZONE
AND
POLLUTION PREVENTION ZONE.
OUTER LIMIT OF EXCLUSIVE ECONOMIC ZONE AND POLLUTION PREVENTION ZONE
10°
9°
8°
7°
6°
5°
4°
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TANZANIA'S EXPERIENCE ON FISHERIES MANAGEMENT AND DEVELOPMENT CASE STUDY

by

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ABSTRACT

Tanzania has substantial freshwater as well as marine fishery resources. The fishery industry is still artisanal using impowered vessels. Limited commercial fishery is practised mainly by public companies.

Fisheries management and development is guided by the policy of socialism and self-reliance. Foreign assistance is accepted with a view to augmenting efforts on self-reliance. Most foreign aided projects have not been able to fulfil their objectives either due to bottlenecks in implementation or due to introduction of unbridged technology and lack of local technicians and spareparts to sustain such projects. Options for fisheries development include regional cooperation in resource surveys, surveillance, joint ventures, harmonization of fishery laws and regulations self-reliance needs to be encouraged through acquisition of technology, provision of infrastructure to attract investment in fisheries, provision of loans and negotiation of joint ventures for the exploitation of deep sea resources.

1. INTRODUCTION

The development and management of fisheries in an organized manner can be traced to the year 1964 when the Fisheries Division was established under the Ministry of Agriculture, Cooperatives and Wildlife. Initially the division was faced with staffing problems and had to limit its activities to fisheries administration, extension services, recruitment and training of professional, technical and lower cadre staff as well as enforcement of the fisheries ordinance.

2. FISHERIES RESOURCES POTENTIAL AND EXPLOITATION

Tanzania has substantial fishery resources in the territorial waters of lakes Victoria, Tanganyika, Nyasa, Rukwa, other smaller inland lakes, rivers, dams constructed for irrigation and the territorial waters of the Indian Ocean. The fishing industry is mainly artisanal supporting over 53 000 fishermen who operate unpowered craft consisting mainly of dug out canoes (mitumbwi), the catamarans (ngalawa), the outrigger canoe and the dhows. Progressive fishermen have made modifications on dhows to have them mechanized and therefore increase their mobility.

The freshwater area available for fishing makes up an estimated 6% of the area of Tanzania and contributes over 80% of the fish landed. The remaining 20% comes from the sea. The main freshwater fish species exploited are *Engraulicypris* sp. (dagaa), *Tilapia* sp., *Protopterus* sp., *Bagrus* sp., *Clarias* sp., *Haplochromis* sp., *Lates* sp. and many other variety of species.

The coastline of Tanzania mainland is approximately 800 km long and includes the islands of Mafia and a number of offshore islands. River Rufiji discharges into the ocean through a complex delta system which forms good grounds for the prawn fishery. Rivers

Pangani, Wami, Ruvu and Ruvuma form important estuaries along the coast. The coast is characterized by a narrow continental shelf with a width varying from a minimum of 6 km to a maximum of 64 km.

The climatic conditions and the productivity of the ocean is influenced by the East African Coastal current which is a northerly branch of the South Equatorial current. Hydro-biological studies indicate that the ocean waters are deficient in the growth of plankton which affects the food chain and consequently the marine fisheries resources that can be exploited. The greater part of the coast is protected by coral formation which reduces the effect of heavy winds. Out of the entire 12 000 km^2 of continental shelf only 1 500 km^2 are trawlable at a depth of 20 m. Another 2 000 km^2 could be exploited by trawling at a depth of 60 m.

The main marine fish species exploited are pelagic fish like kingfish (nguru in Kiswahili), sardines, species of tuna, sword fish and sail fish. The exploitation of crustaceans has been pursued by operators of larger vessels like Tanzania Fishing Corporation. The crustaceans exploited are exported to earn foreign exchange. In areas of main river estuaries prawns are caught seasonally in very limited quantities by traditional fishermen.

3. FISHING TECHNIQUES

Traditional fishermen exploited the resources close to the shore using gillnets/sharknets, seine nets, cast nets, traps of different kinds, handlines/longlines and in remote areas spear fishing is still practised. *Engraulicypris* sp. (dagaa) fishing on lakes Tanganyika and Vistoria is harvested using light attraction using ringnets to haul in the catch. Large purse seiners are operated by Uvuvi Kigoma on Lake Tanganyika and Dar-es-Salaam Development Corporation on the Coast. Nyanza Fishing and Processing Company Limited operates four medium sized trawlers on Lake Victoria to harvest the abundant resources of *Haplochromis* sp. for fishmeal production. Tanzania Fisheries Corporation leads in trawling operations on the coast with 15 medium sized trawlers but operational and technical problems do not allow the Corporation to break even. The table below shows the different kind of gears used for the years 1977 to 1981.

Main fishing gears used - 1977-81

Year	Number of gillnets sharknets		Number of seine nets/ dagaa nets/cast nets		Number of handlines/ longlines, hooks	
	Fresh water	Marine	Fresh water	Marine	Fresh water	Marine
1977	175 695	7 979	2 004	678	283 568	6 193
1978	100 124	6 236	1 818	472	286 550	6 333
1979	124 959	6 121	1 278	678	380 464	3 377
1980	136 130	11 760	-a/	-	-	-
1981	131 110	12 400	-	-	-	-

a/ Figures not available

Sources: Fisheries Division Annual Statistics Report

4. FISH PRODUCTION, TRADE AND CONSUMPTION

The fish production figures for the years 1977-82 for the marine and fresh waters is given below:

Fish production - 1977-82

Year	Number of fishermen	Quantity of fish landed (t)	Number of boats of different sizes	Value in Tan.sh. x 10^3
1977	49 999	260 645	19 645	717 938
1978	42 701	209 481	16 281	627 413
1979	52 928	177 809	22 555	514 062
1980	55 871	219 929	19 698	1 232 929
1981	53 175	249 590	19 701	1 030 768
1982[a/]	59 300	243 700	17 900	1 651 800

a/ The figures for 1982 have been estimated for September-December to make up the years total

Sources: Fisheries Division Annual Statistics Reports

The main bulk of the fish landed is dagaa, *Haplochromis* sp. and other small sized fishes. The highest catches were realized in 1977 and have remained below this figure due to low catch per unit effort. The value of the fish has gone up indicating the high prices the consumer has to pay for fish.

Fish trade is mainly internal but substantial quantities of *Engraulicypris* sp. (dagaa) is exported to neighbouring countries mainly Zambia and Zaire where it is a popular local dish ingredient. Prawns are exported with very little being available for the internal markets, mainly tourist hotels.

The *per caput* fish consumption in Tanzania is estimated at 12.5 kg with a peak of 15 kg reached in 1977. The *per caput* fish consumption varies from 50 kg from the fish landing centres in Kigoma to 1 kg in Dodoma Region (central Tanzania).

5. FISHERIES POLICIES AND OBJECTIVES

The fisheries policy and objectives is guided by the national policy of socialism for self reliance (Ujamaa na Kujitegemea) and aims at exploiting the abundant fisheries resources to provide the much needed animal protein with surplus fish and crustacea being sold to earn foreign exchange.

The policy guides the preparation of the five year plans and the subsequent annual plans. It is specifically geared:

(a) To promote fishing and exploitation of other aquatic resources as a means of making animal protein available to more Tanzanians and consequently eradicate the incidence of protein malnutrition.

(b) To ensure fishermen raise their income and standard of living which should result in eradication of poverty.

(c) To consolidate the national policy of socialism for self reliance resulting in income distribution and people's participation in fish production. Villagers are encouraged to collectively organize, and manage fishing, processing and distribution of fish with financial assistance from the Government and loans from the Rural Development Bank.

(d) To promote and consolidate fisheries training, research, planning for resources exploitation and strengthening the collective fishing ventures under villages and other public Corporations.

(e) To promote regional cooperation in managing and exploiting fishery resources shared with neighbouring states.

(f) To promote the capability for exploiting resources in our marine waters.

(g) To consolidate national efforts to eradicate pollution of the aquatic environment and hence protect the aquatic fauna and flora from the hazards of pollutants.

6. FISHING BOATS CONSTRUCTION AND OPERATION

The main bulk of the artisanal craft is locally constructed utilizing limited hand tools. The draw-backs of the traditional craft are:

(a) Low or limited mobility which restricts their operation to fishing grounds very close to the shore.

(b) Poor sea-worthiness. This endangers the life of the operators.

(c) Unsuitability as working platforms for hygienically handling and storing fish.

(d) Limited space. This restricts the number of operators, the quantity of load which can be carried. This makes them unsuitable for carrying ice.

Tanzania Fisheries Corporation operates wooden boatyard in Mikindani on the Indian Ocean, Mwanza on Lake Victoria and Kigoma on Lake Tanganyika. These boatyards are capable of constructing boats of various sizes including trawlers of 35 ft. Pangani Development Corporation close to Tanga on the Indian Ocean also operates a similar boatyard. The high cost of the boats and lack of engines and spare parts once the boats are operational has discouraged artisanal fishermen from investing on boats from these boatyards. Public Corporations have remained the main customers of boats from the modern boatyards. Presently Tanzania Fisheries Corporation is in the process of setting up a steel boatyard at Mwanza with Dutch technical assistance.

The rate of boat mechanization is slow and faces a lot of operational problems due to non-availability of maintenance facilities and spare parts coupled with lack of adequate local experience to skipper a large motorized vessel. The table below gives a picture of the state of mechanization of fishing vessels.

State of mechanization of fishing vessels

Year	Total number of vessels	Inboard engines	Outboard engines
1977	19 645	33	390
1978	16 281	29	367
1979	22 555	44	89
1980	19 698	a/	-
1981	19 701	-	-
1982	17 900	-	-

a/ Figures not available

Sources: Fisheries Division Annual Statistics Reports

The number of outboard engines is decreasing as many of them go out of operation because of lack of spare parts.

7. FOREIGN AID AND FISHERIES DEVELOPMENT

Foreign Development Aid can be viewed as a stimulant which if applied correctly should activate the industry and accelerate the rate of achieving the objectives of the development plans. The following points are worthy noting when preparing a foreign aided project:

(a) The needs of the country should be taken into account.

(b) The capability of the country to absorb new technology. New technology to be introduced should be appropriate and should be introduced in such a way as to be assimilated.

(c) The duration and time schedule of aid supported projects should aim at the projects being self supporting and able to continue without external support.

(d) The training of indigenous personnel to take up responsibility of running the project activities at the expiry of foreign aid participation.

8. FOREIGN AIDED FISHERIES PROJECTS

The fisheries sector has received foreign assistance from various sources for the five year development period 1976 to 1980 and 1981 to 1985.

(a) NORAD Assistance to Mbegami Fisheries. Fisheries Development Centre

The main objective of the project being to strengthen and expand training facilities at Mbegani Fisheries Development Centre. Initially (1976 agreement) a total expenditure of N.Kr. 17.5 million was allocated to this project. Technical and administrative problems together with escalation in prices necessitated a complete re-evaluation and revision of the project in 1979-80. After the revision NORAD has allocated a sum of N.Kr. 85 million to the project.

On completion the centre will be able to conduct courses in boatbuilding, marine refrigeration engineering, navigation/gear technology and fish processing and marketing. The centre will also conduct short courses for fishermen and extension workers.

(b) World Bank Credit 651 T.A.

The World Bank through its soft loan affiliate the International Development Agency (IDA) approved a loan of US$ 9 million in 1976 for the fisheries sector to cover the foreign exchange component of the project and 36 % of the local costs.

The project activities involved the establishment of three coastal fishing centres at Bagamoyo, Nyamisati and Mikindani. Each centre was to be provided with ten fishing boats; fish receiving facilities, maintenance facilities and housing.

The setting up of the coastal centres has met a lot of operational and technical problems, the main problem being the slow progress in completing the boats under tender to TAFICO and Pangani Boatyard resulting in escalating prices and frustration. These problems necessitated adjustments in the original set-up and inputs. The Mikindani Centre responsibilities were transferred to Mtwara/Lindi Regions Integrated Development Project under British Technical Assistance. The scope of the project has been revised to involve studies on the fish stocks and suitable fishing methods. The restructured Mikindani Centre will receive one purse unit under the IDA credit.

The Bagamoyo and Nyamisati fishing centres have their credit budgets revised to provide for five boats for each centre instead of the original ten.

The following fisheries projects were also part of the IDA Credit:

(i) Uvuvi Kigoma Fishing Company: Under this component the credit would finance rehabilitation of Uvuvi Kigoma on Lake Tanganyika by carrying out repairs on the three purse seine units owned by the company followed by purchase of 10 new purse seine units. The rehabilitation programme could not produce sea worthy vessels and the purchase of new purse seine units has been cancelled from the credit.

(ii) Village Programme: This component involved identification of 20 fishing villages along Lake Tanganyika. These villages would be trained by mobile training teams set up by the Fisheries Division under the guidance of experienced expatriate masterfishermen. At the completion of training the villages would be eligible for loans from the Tanzania Fisheries Corporation. Five villages have successfully been trained and their projects acceptable to the Bank for financing. However, fishing by the villages has begun delayed by lack of netting material and theft of nets and other inputs.

(iii) Technical Assistance: This component covered the recruitment of needed expatriate personnel like masterfishermen, marine engineers and consultants necessary for smooth set up and operation of the coastal fishing centres, Uvuvi Kigoma, the villages programme and the strengthening of financial management capability of the Tanzania Fisheries Corporation.

(iv) Market Study: A fish market study was undertaken for Dar-es-Salaam and the whole of Tanzania to establish the fish distribution channels and the demand/supply structure. This information would be used in planning the distribution and marketing of the fish envisaged in the programme.

(c) Aquaculture Development Project

Aquaculture has been viewed as a means to supplement protein requirement in rural areas far from the fishing centres. This would, in addition to meeting the protein needs help in diversifying rural employment. FAO/UNDP assistance has been available to the tune of US$ 518 506 to cover:

(i) Rehabilitation of existing fish culture ponds in the country numbering about 600-1 000.

(ii) Training of extension workers and fish pond owners.

(iii) Establishment of a pilot project for aquaculture experiments and fish farming demonstrations.

The establishment of the pilot fish farm could not be completed within the life time of the project due to:

- Late arrival of experts.

- Delays in selecting and acquiring the site for the pilot farm. This has resulted in the corp fingerlings and ducklings imported under the project arriving after the project has expired; finding no proper arrangements were made to take care of them.

9. FOREIGN ASSISTANCE TO TANZANIA FISHERIES CORPORATION

Tanzania Fisheries Corporation being the public organ responsible for fostering the development of commercial fisheries has received aid in the farm of fishing vessels of sizes varying from 35 ft to 68 ft with BHP of 38.5 to 350 from Japan (6), United Kingdom (3), Finland (4), Australia (2). Expertise assistance has been received from Japan, United Kingdom and Cuba.

10. REGIONAL FOREIGN AIDED PROJECTS

The UNDP assisted plan for fishery development in the Indian Ocean (Project IOFC/DEV/71/1) has assisted Government with valuable information on the distribution, magnitude and potential of coastal and offshore resources. This information will guide Governments in planning resources development and management strategies.

Under the survey a total of six cruises was undertaken in the Southwest Indian Ocean with a fully equipped USSR research vessel, the R/V PROFESSOR MESYATSEV including scientific and technical staff and chartered by FAO. Three of the cruisers covered the Tanzanian coast: cruise 1, December 1975 - March 1976; cruise 4, July 1977 - September 1977; and cruise 6, November 1977 - December 1977. A total of 8 Tanzanian scientists and technicians participated in the cruises.

A similar survey has been undertaken under NORAD assistance off the Tanzanian coast from 16 June - 8 July, and 11 November - 3 December 1982 utilizing the Norwegian fisheries research vessel DR FRIDTJOF NANSEN with its scientific and technical staff. A third cruise is planned for January/February 1983.

The cruises have indicated the distribution and concentration of pelagic and demersal fishes and charts of fishing areas have been prepared.

10.1 Impact and Problems of Foreign Aid

Development aid can be meaningfully utilized if it is geared towards what the local economy and skills can support.

In this respect the technology involved should be appropriate to the prevailing situation in the recipient country and as fas as possible independent of continuous foreign exchange requirements.

The continuity of fisheries projects can be guaranteed if easy availability of spare parts and skills to run and maintain the machinery is incorporated in the project at the planning stage.

(a) Experience gathered indicate that most projects do not take into account the technical and environmental capability of the project to continue after the expiry of foreign participation. Projects dependent on imported spare parts and skills collapse as soon as foreign participation ceases. Good planning for continuous operation of a foreign added project should:

  (i) Provide an alternative source of spare parts.

  (ii) Guarantee that all foreign components of the project can continue to be available after the expiry of foreign participation.

  (iii) Develop local skills and motivation for the trained personnel to remain on the job.

(b) Foreign aided projects get limited financial support after foreign participation ceases. This limits the operational activities of the project.

(c) Lack of experienced management staff committed to the continuous operation of the project.

(d) Delays in completing major components of the project resulting in projects expiring leaving behind uncompleted project components and no plans to have them completed.

The FAO/UNDP project expired before the pilot fish farm was established. The ducks and fish fingerlings also arrived after project expiry depriving them of the full attention they would have received if they had arrived within the project time schedule.

(e) Lack of local commitment to continue supporting foreign aided projects after stoppage of foreign participation. This is seriously noticed with capital intensive projects.

(f) Introducing very complicated technology which continues to demand foreign exchange support.

11. FINANCIAL, INSTITUTIONAL AND FISHERIES DEVELOPMENT

Tanzania Rural Development Bank (TRDB) is the main financial institution giving support to small scale fisheries projects. It supports projects operated by fishing villages; fisheries cooperatives, fisheries development corporations and individual fishermen with viable projects.

Tanzania Investment Bank (TIB) and Tanganyika Development Finance Company (TDFC) have financed capital intensive fisheries projects undertaken by Nyanza Fishing and Processing Company and Tanzania Fisheries Corporation (TAFICO).

The East African Development Bank (EADB) has undertaken feasibility studies on the viability of a regional fisheries project on Lake Victoria to exploit the abundant resources of *Haplochromis* species for fishmeal and direct human consumption.

Lack of basic data on the profitability of fishing operations and the observable experience that fisheries projects have suffered from poor management and administration and end up with heavy financial losses makes the financial institutions very cautious and critical of financing fisheries projects.

Government assistance available through the Regional Development Fund (RDF) acts as a good stimulant to fishing villages, and district/regional development corporations to initiate fisheries projects and thereafter seek credit support from the Rural Development Bank.

(a) Exclusive Economic Zone (EEZ) Concept

Tanzania has so far not declared a 200 mile exclusive economic zone. The declaration of such a zone will require heavy investment in developing national capabilities for scientific research, establishment of sound policies for rational exploitation and management of the renewable resources, legislation enforcement mechanism and the surveillance of an extended area which cannot be done with the traditional naval methods or limited vessels available for other uses. Tanzania on its own does not have the infrastructure to face the new challenges coming out of an Exclusive Economic Zone (EEZ).

(b) Joint Venture Experience in Fisheries Development

Joint venture agreements have been considered as attractive possibilities of cooperation between a developed country which will provide the technology and the capability to exploit a resource and a developing country which may have a resource but is unable to exploit it due to limited technical and financial capability. Negotiations of joint ventures is a cumbersome process which requires all the experience that can be available.

In Tanzania, Tanzania Fisheries Corporation (TAFICO) has negotiated two joint ventures:

(i) In 1979 a joint venture company TAFICO - GULF Fisheries Limited was established between TAFICO and MARCOTRADE, a Swiss company. The joint venture aimed at collecting prawns from fishermen in the Rufiji Delta using a mothership with processing facilities on board and collecting boats. The mothership was a hired factory vessel which the joint venture had to pay US$ 2 000 per day to operate as a floating station in the Rufiji Delta. The vessel had an ice making machine, freezing and cold storage facilities to facilitate processing, packing and storage of

prawns purchased from fishermen. Shore stations were established covering the major fishing villages. Five fibreglass 21 ft boats fitted with outboard engines were available to collect prawns caught by the fishermen on a daily basis with one boat covering two to three villages. Cash payments were made for the purchase of the prawns. The product collected was transported to the mothership for processing and storage. Once exportable quantities or prawns were obtained they were transported to Dar-es-Salaam from where they were exported by air.

The hiring of the mothership at US$ 2 000 per day made the project unprofitable and had to wind up after six months of operation.

(ii) At the end of 1980 Tanzania Fisheries Corporation went into partnership with Atlantic Fishing Company of Greece. Under the agreement experimental fishing to explore the suitable fishing grounds was undertaken for a period of six months using two vessels. The agreement also contained the following considerations:

- Atlantic Fishing Company would employ Tanzanian crew up to 70% of the manning requirement for the vessels and would also undertake to train the crew and pay their remunerations.

- Atlantic Fishing Company would bear all the costs and risks arising or incurred in the process of furthering the joint venture.

- Tanzania Fisheries Corporation would place on board one inspector who would record all catches to the satisfaction of the joint venture partners.

- All fish and crustacea caught was to be landed in Tanzania ports before being packed for export.

- The revenue accruing from the sales of fish and crustacea would be shared between TAFICO and AFC in the following manner:

  (a) For export sales 25% would go to TAFICO and 75% to AFC.

  (b) For local sales 65% would go to TAFICO and 35% would go to AFC.

This joint venture wound up after six months of operation having managed to land a total of 355 404 kg of fish and prawns out of which 202 404 kg of prawns were exported. The main problem of this joint venture was the scanty information available on the fish resources beyond the 20 fathoms and the unwillingness of the foreign company to bear the greater risk of carrying out resources studies beyond the inshore waters.

For sound joint venture negotiations information on the size of the resource, distribution and suitable technology for exploitation are necessary. This information is vital in determining the attractiveness of the joint venture as foreign companies avoid investment for resources studies.

12. OPTIONS FOR FISHERIES DEVELOPMENT

The inland fisheries of Tanzania and the marine resources beyond the continental shelf are capable of supporting further investments. For the inland fisheries and lakes Victoria and Tanganyika the abundant resources of *Haplochromis* sp. and *Engraulicypris* sp. (dagaa) can be exploited and distributed in cured and fresh forms to areas defficient in animal protein. International food aid provided by World Food Programme (WFP) and World Food Council (WFC) should be channelled to increasing the capability of harvesting, processing and distributing these resources as food aid in areas requiring protein.

In the marine fisheries sector, the exploitation of resources in the EEZ will require the following:

(a) Regional Cooperation as is now in the Southwest Indian Ocean FAO/UNDP supported project. Through regional cooperation research on stock identification, stock size, nature, distribution, seasonal variation and suitable methods for exploitation can be undertaken. Cooperation will ensure the costs are reduced, by removing duplication of effort and ensure good use of the limited manpower and funds. Other areas requiring regional cooperation are:

(i) Surveillance to enable coastal states with a bigger area to manage and patrol such areas in order to minimize illegal fishing by foreign vessels - joint surveillance action will reduce the costs that a single country would have incurred.

(ii) Joint training programmes to ensure that training facilities in the region can be used at optimum costs. Tanzania has, through NORAD assistance, a well equipped training school for technical subjects in fisheries. This facility is suitable as a regional training centre.

(iii) Harmonization of legislation to ensure uniformity of application and facilitation of quick action on culprits who might seek refuge in the neighbouring states if legislation is relaxed in some of the states.

(iv) Work out strategies for negotiable sound joint venture agreements. Efforts to establish joint ventures in Tanzania have been made difficult due to lack of adequate information on the stocks.

(b) Greater emphasis shall be placed on development of the required infrastructure to catch, process, preserve and distribute fish and fishery resources.

(c) Intensify efforts to strengthen the fishing capability of existing public-owned fishing companies, fishing villages and private companies.

(d) Consolidate efforts undertaken to improve the data collection and dissemination system to facilitate proper planning for the management and rational exploitation of the resources.

(e) Tanzania will for sometime not be able to exploit resources beyond the continental shelf because of limited capability of the artisanal fishermen, fishing parastatals and fishing villages. It may also take sometime before well formulated joint ventures can be negotiated. In this case, there is a need to develop strategies for licensing foreign fishing vessels. This will minimize "poaching" by foreign vessels as well as earning revenue for the country.

THE ROLE OF THE PUBLIC SECTOR IN PROMOTING FISHERIES

by

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ABSTRACT

Governments need to promote fisheries for economic and social reasons and to exercise sovereignty over the new EEZ's. This paper outlines the main points to be borne in mind when the governments of developing countries are considering what strategies they should follow. The basic role of the government is to create the conditions and instruments to promote the appropriate strategies of: (a) integrating the various technical, social and economic factors in fisheries development; (b) encouraging various types of fisheries (artisan and industrial); (c) linking fisheries to local markets; and (d) avoiding a uniform overall plan in favour of giving individual attention to the development of each aspect of each different fishery. The suggested instruments to achieve these ends are discussed under the following headings: organization of the fishery; training; providing financing (especially by supplying "risk" capital); the promotion of cooperatives and joint ventures; expanding the domestic market; and creating suitable infrastructures for planning, etc.

INTRODUCTION

The food requirements and the exercise of sovereignty over the Exclusive Economic Zones (EEZ) are, in most countries, the main reasons for proposing the active participation of the public sector in fisheries development.

There are also more immediate and longer term economic reasons for governments to devote more attention to fisheries and to their promotion. In an international economic environment that fluctuates between inflation and recession (when it is not suffering from both together), the generation of productive employment and foreign currency and the contribution of fisheries to regional development, assume great importance especially since fisheries can provide many projects that mature quickly and require little investment per unit of output and employment, thus minimizing the inflationary effect of a temporary increase in demand while creating a new supply.

It is in this context that the public sector should plan, promote and participate in fisheries development. Apart from production, the aim should also be to (a) become financially self-supporting in the long term; (b) maintain, and even increase, the fishery resource; and (c) achieve better regional and functional distribution of the income it generates.

The establishment of an EEZ must be managed as an expansion of the economic space to create new and better investment opportunities and in such a way that the impulse given to fishery will serve as a springboard for regional and national development.

Some fisheries and fishery regions are sufficiently dynamic for the policy to be simply one of support, while there are other species and zones which will require a more determined effort, including the provision of the human and material resources. In these cases it is the government's task to eliminate obstacles or provide what is lacking.

The strategy for fisheries development in a country whose resources have been considerably increased through the establishment of an EEZ, and in which the fishery sector is starting to become an integral part of the domestic market are summarized under the following points.

STRATEGIES

Integration of the Technical, Economic, Political and Social Factors that Contribute to Fisheries Development

Avoid overfishing for the sake of quick profits; balance the interests of producers and consumers: take care to see that growth of the fisheries does not cancel or affect other options, and vice versa; keep the legal framework in step with reality in the fishery sector. These are some aspects of the strategy. This integration should be achieved within the framework of a national fisheries development plan that also contains a programme of action for the public sector.

Stimulation of Development of the Various Types of Fishery

There are many countries in which a semi-industrial fishery geared to the external market coexists with an artisanal fishery that is very dependent on the conditions imposed by the traders who cater to the domestic market. Public action should, therefore, be directed toward: creating highly industrialized deep-sea fisheries, such as tuna fisheries, which also have great weight in what is done to exercise the new rights of sovereignty; extending semi-industrial fishery to other species more linked with the domestic market (scale fish and sardine); and making artisanal fishery more productive and less dependent, a task that requires special attention from the government through flexible credit and trading schemes.

The particular combination of forms of productive organization that results will depend not only on the natural resources available but also on the availability of capital goods and the potential of the domestic market.

Linking Fisheries Development More Closely to the Domestic Market and Stimulation of This Market

In many cases the influence of the external market on the formation and evolution of the fishery sector is quite marked and this has resulted in other possibilities for promoting the sector being overlooked. Production for national consumption may be less profitable than production for export, so the government must try to remedy this by providing financial and fiscal incentives and establishing an infrastructure suited to the internal conditions in the country. It is also necessary to establish the concept of a "currency budget" so that the currency generated by the fishery sector is used mainly to meet the requirements of the effort to promote the domestic market.

Paying Special Attention to Each Fishery and/or Region and to the Groups Responsible for its Development

If maximum advantage is to be taken of the contribution that fisheries can make to national development, the greatest error would be to apply a uniform policy that does not take into account the relative degree of development of each element or factor.

The creation of a deep-sea fleet; the launching of aquaculture; giving artisanal fishery the place it deserves; the organization and training of producers, may all require different degrees and combinations of stimulus and participation by the public sector, whether fiscal, financial, or even in the supply of risk capital. Depending on the circumstances, priority should also be given to food aims or regional objectives connected with a fishery development project.

ROLE OF THE GOVERNMENT

The basic role of the government is to create the conditions and instruments that the strategy requires. Of these, the most important are:

Organization of the Fishery Sector Itself

It frequently happens that fisheries are ranked low and made dependent on other functions within the public administration structure. The first step in a comprehensive fishery promotion policy must be to recognize the fishery sector's autonomy with respect to other activities and the fact that it embraces the catching, processing and marketing of fishery products. The fishery authority must also have the same capacity for action and representation as other authorities. In Mexico, fisheries did not achieve the rank of an autonomous department within the Presidential Cabinet until 1977; a rank which was confirmed in 1982 when it was turned into a Secretariat of State.

Organization and Training of Producers

Seen in perspective, the public sector's most essential and lasting functions are to promote the material and human infrastructures required. Its tasks range from supplying rural fishing communities with basic services to providing technical advice that will enable the so-called "free fishermen" to administer their resources more efficiently to providing access to modern financial and marketing mechanisms. These functions are also closely linked with those of scientific and technological research. In both aspects (training and research) it is important that the fishery authority have its own machinery and bodies, without ignoring the possibility of using others, such as the formal education system or university research.

Relations between the public and the private sector should take the form of coordination of the basic objectives and policies of fisheries development which have been arrived at through a process of democratic planning. The government will then establish specific measures to make it in the interest of entrepreneurs and workers to participate in this development. In the case of Mexico, in addition to the private sector properly so-called, there is a social sector composed of fishery cooperatives for which the law reserves the exploitation of some important species.

Specific Financing

Lack of administrative and economic support for the role of fisheries has resulted in the lack of any specific scheme of financial support. In addition, the application to fisheries of the credit regulations used for other sectors has not given satisfactory results. The outcome is usually a lack of the right kind and amount of financing. An appropriate solution could be the establishment of a bank or specialized development fund, particularly if financial aid is supplemented by technical assistance and if the policy of interest rates and repayment periods takes into account not only the nature of the project to be financed but also, and above all, the economic and social objectives it is hoped to promote.

Another important aspect is the possibility of the public sector participating in joint investments, since the risk capital contributed by the government and, in particular, the security provided by association with it, are often indispensable to initiate projects that would otherwise be very difficult to launch with the private sector alone because of their complexity, scale or novelty. It is recommended that public participation be as limited and temporary as allowed by the time each project requires to mature and acquire experience.

Joint investment by the public, private (and, where applicable, social) sectors, is a device it would be useful to employ more often, because of the possibilities it offers for reconciling productive and economic objectives with the political and social objectives at which fisheries development must also aim.

Expansion of the Domestic Market

The mechanisms that can be used to increase national supplies include: (a) making better use of the fleets built up to meet external demands by using by-products and the vessels themselves when it is the closed season for the exportable resource; (b) promoting the incorporation of units that difersify the use of species and zones (modernizing shrimp boats, mechanizing artisanal fishing, providing refrigeration for the sardine fleet, introducing larger units for large-scale fishing of scale fish, etc.); (c) industrializing

production in ways that facilitate regional and social distribution; and (d) improving or creating the trading infrastructure so as to ensure the flow of the products in accordance with food policy objectives.

Also needed are public actions with regard to preferential financing; schemes to ensure purchase at minimum prices; and the creation of distribution channels (which do not necessarily have to be operated by the public sector itself). In this latter connection, the establishment of regional cold plants to ensure the storage and supply of perishable products is particularly important.

At the same time, consumption must be protected and encouraged through price regulation mechanisms and new ways of presentation that help to reduce the final cost and/or avoid high expenditure on conservation. By taking actions to influence the supply and demand of fishery products, it is possible to make the domestic market an increasingly dynamic factor in fisheries development.

The internal and external economic restrictions from which most countries are suffering make it advisable to reassess the role of fisheries in a national development strategy; and within this, to devote more attention to activities that, because of their nature, can be more easily incorporated in the internal market (e.g. artisanal fishery and aquaculture), and which can also serve as a supplement or basis for traditional rural activities. In Mexico the concept of "integrated rural development" has recently been established at a constitutional level. This will provide a more adequate framework for promoting fisheries development. The institution of a Secretariat for Urban Development and Ecology will also make it possible to pay greater attention to intersectorial planning that, among other things, encourages the simultaneous utilization of water for agriculture and aquaculture; reduces the pollution of bodies of water by industrial and agricultural waste; and coordinates fishery, industrial and tourist development. Because of its complexity, and the amount of currency required, the creation of deep-sea fleets should be examined in the light of cooperation between developing countries and the constitution of international joint-investment enterprises.

In any case, it is essential for fisheries development that the public sector devote special attention, and/or participate more decisively, in organization financing and marketing.

MARKETS FOR FISHERY PRODUCTS

by

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ABSTRACT

The main use of fishery products is as food, for both humans and animals. They can also be utilized as organic nutrients for cultivating crops and as a raw material for various industrial products.

Although more than one billion human beings are undernourished or in a state of hunger, total production of caloric foods in 1982 was more than 10 percent over that required for a minimal diet to feed the 4.4 billion persons that inhabit this planet. With reference to animal protein, there is, however, a deficit of 40 percent to reach a theoretically balanced diet for everybody.

Food consumers on the earth may be grouped in three types of markets: (a) the animal protein eaters (middle and high income humans); (b) low income humans and the cattle and poultry of developed countries that eat basically caloric foods (grains) plus some low cost animal protein; (c) very low or no-income humans who eat the food they can produce themselves, or the leakages and wastes from the other two groups.

The increasing demand for animal protein causes almost 50 percent of the world's grain crops and 30 percent of fish catches to become diverted for animal feeding. Almost all countries - developed or developing, open market economies or central planned ones - show this pattern of food consumption.

Fish products offer excellent opportunities of improving supplies of cheap and high value human food and highly nutritious feeds for animals. In this context, it seems irrelevant to speak of "internal or export markets" for fishing products as a pre-determined orientation for fishery development. Countries should plan their sector development according to the available resources, their socio-economic needs and their comparative advantages in foreign trade. The products will flow to their natural markets in any case.

FISHERIES AND THE FOOD PROBLEM

One important concept to be understood is what fishery and aquaculture mean as an economic activity. Physically described, fishery is the action of extracting (by catching or hunting) or cultivating animals and plants that have their normal or most frequent living environment in the waters. The economic objective of fisheries is obviously to sell the products on the markets.

The main use of fishery products is as food, for both humans and animals. They can also be utilized as organic nutrients for agriculture or as raw material for certain industrial products.

Although more than one billion human beings are undernourished or in a state of hunger, or even starving, the total production of caloric food is about seven to ten percent over the requirements for a minimal reasonable diet to feed the 4.4 billion persons that

inhabit this planet. In matters of animal protein there is, however, a deficit of 40 percent to reach a theoretically balanced diet for everybody.

For a long time the easy excuse to explain hunger on earth was excessive population growth. Today, there is more food than mouths to feed, but we still have a lot of hunger. The explanation then given for hunger was the unequal distribution of resources and income which means that many people do not have sufficient purchasing power to buy food. These frequently include children, old people and women unable to work for their sustenance.

There is, however, an additional factor in the world food problem. It is the presence of a growing "food chain", what I call the "Food Chain of Affluence", whose first link is the increasing demand for animal products by the high and middle-income people of both developed and developing countries, whether socialist or capitalist.

Because it is physically impossible to have lunch or dinner many times per day, the purchasing power that cannot be used in buying food in quantities turns to quality and sophistication. This represents beef, chicken, pork, lamb or fish. From all these sources of animal products for human nutrition, the most expensive converter of food are bovine, which need between 7 to 10 units of food to produce 1 unit of beef (although milk is an additional product). Fish is the best food converter requiring sometimes 1 to 2 units of food to produce 1 unit of edible meat. Fish is a cold blood animal that burns a small proportion of food for heat and energy.

In addition to that, fish do not need agricultural land or to compete with humans for food. Fish culture requires one-third to one-thirtieth of the energy spent by agriculture. Water where fish live could still be utilized for many kinds of uses, such as drinking water, irrigation or hydraulic power.

Out of the some 220 million tons of meat produced annually in the world, fish is the first individual contributor with 73 million tons. Cattle is the second with some 55 million tons; pork comes third with 44 million tons, then we get 24 million tons of chicken and 24 million tons of eggs. Thirty percent of the total fishery production is, however, used for animal feeding instead of human nutrition. On the other hand, 41 percent of the world's annual cereal crop is devoted to animal feeding. Developed countries, according to FAO, are using 72 percent of their cereal crops for animal nutrition.

In other words, the "Food Chain of Affluence" takes a great portion of the available food to satisfy the demand of the wealthiest markets of the world. It would take only 10 percent of the cereals devoted to animals by the developed countries for there to be no more hunger on this planet, provided that a good distribution system could be put into effect. The problem is that these animals have a purchasing power that many humans lack.

It must be accepted, however, that the "Food Chain of Affluence" is only a form of converting cheap cereals into expensive meats which have a solid market. It does not need to be destroyed. What should be done is to create "Food Chains of Austerity" to satisfy the needs of those humans which are outside of the economic market.

This is the broad framework for modern fisheries and aquaculture: to supply, on the one hand, sophisticated foods for those that have more money than they can eat and, on the other hand, to offer inexpensive food for those that have no purchasing power to buy meals.

THE "MARKETING" APPROACH

Even though the "Food Chain of Affluence" is technically a poor way to convert cheap foods into expensive ones, it must be recognized that it is an efficient marketing system to adjust the overcapacity of grain production to the market demand. The problem is that almost a quarter of all human beings do not have sufficient income to be part of that demand.

Modern technologies of food production tend to reduce costs and increase output. Yet, as a rule, they are applied only to final products that compete in middle and high-income markets. To gain the preferences of the consumers, even making them eat more than their biological requirements, food stuffs incur expensive processing and publicity costs, such as packaging, advertising, and other demand inducements, which put them beyond the reach of the poor. Since the modern food industry has been built to serve the affluent markets, it cannot readily meet the needs of low income consumers. Pet food products are more developed than low cost human foods.

Some worthwhile initiatives include the introduction of simple techniques of food production and preservation for self consumption; better use of food actually processed for secondary purposes (as animal feeding); manufacture of non-traditional foods; reduction of post-harvest losses, etc. Development of non-traditional technologies for manufacturing low cost foods for massive consumption should be promoted through institutional marketing channels (e.g., school food programmes, factories, public services, armed forces, hospitals, popular restaurants, etc.). Along with such possibilities, the primary measure needed to bring about meaningful progress is a concerted global institutional action in the various aspects that bear upon both the production of cheap food and the marketing infrastructure 1/.

The urban population is expected to grow over the next two decades from about 200 to over 320 million in Latin America alone. Due to transport constraints, a large part of that population must eat outside their homes, in factories, schools, or in public fast-food outlets. This kind of "institutional feeding" creates a centralized purchasing power, which is largely independent of personal preferences, habits and traditions of consumers. It therefore provides unique opportunities for the introduction of new products and changes of customary food consumption patterns.

Many countries now have programmes to subsidize basic foods; schemes that are well suited for introduction of non-traditional foods. Institutional feeding of nutritionally vulnerable target populations - such as expectant or lactating mothers, infants, adolescents and the elderly - is growing by leaps and bounds in all countries. These programmes use different modes of operation: donation of food at health posts, free school breakfasts or lunches, subsidized food distribution chains, food coupons and stamps. The common denominator in all these efforts is that they generate purchasing power, a factor that makes supply of non-traditional foods an economically viable proposition.

THE SUPPLY OF FISHERY PRODUCTS

In the extraction of natural resources, there are two types of fishing activities: artisanal fisheries and industrial fisheries. The basic difference between them originates in the environment where they operate. In shallow sea waters, as well as in freshwater areas, the physical conditions of the environment do not permit the use of large boats or mechanized fishing gear for catching big quantities of fish. In addition to this physical constraint there is also a biological limitation, since excessive catches of species living in these restricted areas would affect their survival. Productivity in this case depends essentially on the ability to use the limited equipment, or in other words, on the "art" of the fisherman. That is why this activity is called "artisanal".

For industrial fisheries, productivity depends principally upon the mechanized equipment onboard large vessels rather than on the ability of fishermen, although training and capability are also required.

Cultivation of aquatic organisms is another form of fish production. Depending upon the degree of control exercised over the environment, technologies for cultivation of living aquatic organism could be classified under three categories: extensive, semi-intensive, and intensive aquaculture. Extensive aquaculture involves the stocking of ponds and rivers with fish from other places. No food, nutrients or environmental modifications are introduced. Semi-intensive or "rural aquaculture" is the cultivation of aquatic organisms under partial control of the environment, e.g., fish in artificial ponds with no additional food. Intensive aquaculture, on the other hand, involves egg hatcheries, development of larvae and post-larvae, growing fingerlings and fattening juveniles in captivity for final collection and processing. There is an additional form of aquaculture which is the so-called "sea ranching". It involves different ways of rearing or nourishing fish species in their natural environment, by facilitating or protecting their growth until the moment of harvesting.

Mariculture - that is aquaculture in sea water - offers interesting possibilities for rural coastal areas. Mussels, oysters, clams, salmon, shrimp, mullet, and milkfish are some of the best known species suitable for mariculture that are actually being exploited in many countries.

1/ The IDB, in cooperation with the Fisheries Department of FAO, is preparing a feasibility study for an investment project intended to produce non-traditional foods from pelagic fish of South America for mass institutional consumption

PROSPECTS FOR FISHERY MARKETS

Competition of fishery products with other meats seems to be favourable in the three markets mentioned earlier: sophisticated products for high income consumers; simple technology food for middle income consumers; and low price products (including non-traditional foods), for low income populations.

High value sophisticated products show little price elasticity since the main factor of demand is the personal preference of high income consumers. Demand for these products will increase in the same pattern as quality, presentation and availability will improve. Shrimp and salmon from aquaculture and increasing tuna catches are good examples of expanding supplies within this market.

In the middle price type of foods, where fish are in competition with chicken, there are two major fishery products that are gaining consumer preferences and the Latin American countries have been pushing these options very strongly in recent years. One is the supply of frozen hake, sea trout and croaker in fillets or H and G. The other is the increasing supply of sardine, mackerel, horse mackerel and anchovy from the abundant fisheries of the southern hemisphere. The proximity to the coast of these fishing grounds makes it possible to use inexpensive types of boats and gear to catch big quantities of fish. Preservation and presentation technologies are the key problem for the mass introduction of these low price products into large middle income markets. Frozen transportation and the cost of cans are still a limiting factor for the economy of this important source of cheap animal food.

For low income markets and for populations isolated from urban markets, the introduction of aquaculture is often a new contribution to their food supply and a diversification of their sources of income. This is particularly important in many tropical countries where the rapid growth of fish offers a profitable and easy way of animal protein production.

Nevertheless, in the overall context of new markets of fishery products, the expanding urban institutional demand is the most promising one. Two important conditions have to be fulfilled for success in this area: one is to offer a stable,(i.e., non perishable) and feasible product (capable of being easily prepared in many forms), and secondly, to offer a swift distribution and good presentation at low cost. As an example of what this market could represent, we can mention that in Brazil alone, the School Food Program serves 25 million meals every day which means that it has both the necessary institutional organization and the appropriated purchasing power. The only problem is that no response has been forthcoming from the fishing industry so far.

THE LATIN AMERICAN PERFORMANCE

Latin American countries have shown substantial increases in their fish landings and in domestic consumption. Chile, with 3.7 million tons in 1981 is now the fourth largest fishery country in the world, while Peru is the sixth with 2.8 million tons and Mexico has over 1.2 million tons.

Between 1968 and 1980 (and excluding Peru because of its extreme fluctuations), the Latin American countries increased their annual fish landings from 2.5 to 6.6 million tons, that is to say about 165 percent (see Table 1). The domestic consumption of fish as human food also expanded from 7 kg per person to 11.6 kg, i.e., 65.7 percent.

Latin America, which has been a traditional fish exporter over the past 20 years, has shown positive trends in its foreign fish trade. One is the change of the composition of the value of exports from fish meal and fish oil to more valuable products. Another is the increase in the trade surplus of fishery products.

Table 2 indicates that fish meal fell from 60.1 percent of the total fishery exports in 1970 to 25.1 percent in 1980 although the actual volume of the physical product did not diminish ostensibly. On the other hand, molluscs and crustaceans increased their participation from 26.7 percent in 1970 to 46.3 percent in 1980 and are now the main source of exports from the region. Frozen and chilled fish also increased from 2.9 percent in 1970 to 16.9 percent in 1980. The following figures give a brief outline of this transformation during the three year period between 1977-80.

AREA	IMPORTS			EXPORTS		
	1977	1980	% Increase	1977	1980	% Increase
	(million US$)			(million US$)		
Mexico, Central America and Panama	123	179	45.5	406	843	107.6
South America	110	175	59.1	651	1 221	85.6
TOTAL	233	354	59.9	1 057	2 064	95.2

The surpluses in the external trade of fishery products are increasing steadily. In 1970 fishery imports represented 19.6 percent of the fishery exports. In 1980 imports were only 13.9 percent of the exports which reached US$ 2.1 billion.

In 1980 fishery exports accounted for 2.1 percent of the total exports of Latin America. Ten years before, the proportion was negligible. For some countries the participation is very significant: Panama 13.2 percent, Peru 7.9 percent, Chile 7.8 percent. Other countries with fishery exports around or over 5 percent of their total exports are: Ecuador, Nicaragua, Mexico, Uruguay, Bahamas and Honduras.

Looking at the fish market for the next decade, Latin America offers a promising expanding capacity in both volume and value of final products. This does not include some new developments such as salmon farming in Chile, mollusc and shrimp culture in many countries, and the utilization of krill from Antarctic waters.

It is time to recognize that mankind is more liable to perish by war than by food scarcity and if agriculture at some time is not able to satisfy human needs, then there is plenty of water to do so, and perhaps with many advantages as well.

Table 1

Latin America: Development of fish production

Country	1968-80		Increase
	1968	1980	
	(Thousand tons)		
Argentina[a/]	250.0	393.9	57.6
Bahamas[a/b/]		4.0	-
Barbados[a/]		3.7	-
Bolivia		4.0	-
Brazil[a/b/]	373.0	850.0	128.0
Colombia[a/b/]	52.0	65.3	25.6
Costa Rica[a/b/]	3.8	14.9	292.1
Chile[a/b/]	1 300.0	2 800.0	115.0
Dominican Republic[a/b/]	4.1	9.2	142.4
Ecuador[a/b/]	53.0	671.0	1 166.0
El Salvador[a/b/]	8.0	14.0	75.0
Guatamala[a/]	5.0	4.9	-
Guyana[a/b/]		24.0	-
Haiti[a/]		4.0	-
Honduras[a/b/]	2.5	6.4	156.0
Jamaica[a/]		9.7	-

Table 1 (Continued)

Country	1968 (Thousand tons)	1980 (Thousand tons)	Increase
Mexico[a/]	256.0	1 240.2	384.4
Nicaragua[a/b/]	3.4	19.9	485.0
Panama[a/b/]	40.0	194.7	386.0
Paraguay[a/]	2.0	2.7	35.0
Peru[b/]	10 200.0	2 700.0	-
Trinidad and Tobago	11.0	4.5	-
Uruguay[b/]	15.0	120.4	702.0
Venezuela[a/]	119.0	171.8	44.0
TOTALS	12 697.8	9 333.2	165.5%
Total without Peru	2 497.8	6 633.2	

a/ IDB technical assistance
b/ IDB loans

Table 2

Proportional participation of the seven fish export products from Latin America, according to their importance in value 1970, 1975, 1980

Category	1970	1975	1980
Fish meal	60.1	29.6	25.1
Crustaceans, fresh, frozen, dried and salted molluscs	26.7	47.7	46.3
Fish oils and fats	7.9	6.5	2.1
Iced and frozen fish	2.9	10.3	16.9
Crustaceans, mollusc products hermetically canned or not	1.3	2.8	1.3
Fish products hermetically canned or not	0.9	2.4	7.4
Dried, smoked, salted fish	0.2	0.6	0.9
	100.0	100.0	100.0

CONFLICTS, COMPATIBILITY AND CONSTRAINTS IN DETERMINING FISHERY DEVELOPMENT OBJECTIVES

by

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ABSTRACT

The paper describes why there is so often a gap between a Government's objectives and actual practice and suggests that, prior to determining development objectives, broad studies should be made on each fishery stock to identify and quantify benefits that could be obtained from different actions. This should be followed by detailed studies at national level to see how the actions can be best implemented. Socio-political judgements can be as important as economic ones. Typical constraints mentioned for developing countries are described.

Of central importance to the determination of any objectives in a sector such as fisheries, is the nature of the national development framework and the overall objectives, management and practice of implementation. Whilst the objectives of some governments may be reasonable and practical, there is, in fact, often a serious instability in many countries, a gap between theory and practice, and the accompanying policies may be changed abruptly and often in crisis conditions. Some of the key constraints to development may be the availability of foreign exchange to ensure continuous supplies of fuel, spare parts and varied import requirements to meet the needs of recurrent and capital expenditure. This shortage of foreign exchange may be due to shortage of encouragement to the expert sector in the form of low prices, poor transport services, etc. There may be a critical shortage of jobs, or a critical shortage of skilled labour. In some countries, the legal system may be enforced ineffectually, so there is no clear process for an investor to follow. The overall Government policy may be to assist poorer strata of the population; yet with no clear accompanying Government strategy and commitment to protect the interest of the artisanal producer. In practice, the Government may operate an overvalued exchange rate, which can effectively be contrary to interests of the poorer strata, often in rural areas. Banks and financial institutions may not be geared to receiving and using savings, nor to serve the needs of rural clients. The urban community most frequently is growing fast, and has more vocal demands on Government, than has the less organized and poorer rural community.

Prior to determining the development objectives of the fishery sector, broad studies should be carried out on the fisheries of each stock, or group of stocks, to identify the general benefits that could result from different types of action (e.g., increased catches from underutilized resources, reduced costs from control of fishing on heavily fished stocks), with rough quantifications of those benefits; then, more detailed studies of how these general actions might be implemented in practice and the form in which the potential benefits might be realized. This will pose questions that will have to be answered by further analyses at the resource level, which will also, in general, be required at regular intervals to take account of new information coming from the biological studies of the resource.

The more detailed studies are best undertaken at a national level, and will relate to the net returns (to vessels, processing plants, etc.) at different levels of fishing and in the framework of different management objectives and expected fluctuations on stock abundance.

The analyses and associated sensitivity analyses may give emphasis to economic and financial criteria such as the return on investment and the net present value as a ratio to capital cost, or the value added per employee (and its most equitable distribution), the capital cost of creating employment, foreign exchange as a percentage of both capital and recurrent costs, cost per ton of protein landed, or financial criteria in terms of net present values, and the ratio of gross revenues (in present value terms) to capital cost.

Socio-political judgements need to be made not only with respect to the areas which should receive particular attention, but also with respect to the type of economic organization that should be promoted. For example, the marine fisheries of many countries are still dominated by the artisanal sector and while economic analyses may indicate that this sector should be replaced abruptly by more efficient forms of exploitation, a policy recommendation along these lines would be unacceptable, both socially and politically.

There is the problem of low morale and high turnover of Government support staff. There is a continuous flow of personnel in and out of training schemes financed by external and local agencies, but few of the ex-trainees can usefully apply their knowledge to local conditions, or indeed appear to have the initiative and the incentive to work actively at tasks for which they were trained, e.g., statistics improvement, gear trials, fishery extension, etc. The Government service, which should be in a position to support the sector, is often weak and lacking commitment. Sometimes politicians and senior civil servants insist on supervising too closely and approving activities, so that the drive and ability of junior staff to improvise (and/or take advantage of unforeseen initiatives and opportunities) is discouraged. In many countries, there is a high capital cost public sector State fishing corporation which proves incapable of covering costs. Often a fuel subsidy is introduced, or tax exoneration allowed, but then they prove difficult to remove, and end up by aiding uneconomic ventures at great loss to Government. At times, the encouragement of cheap imports can lower the price of fish so much that local entrepreneurs and fishermen are discouraged from investing in new vessels; or they may concentrate on fishing high value species for export and discarding the lower value fish at sea.

The International Development Association (IDA) of the World Bank has admitted that its fishery projects were initially beset by problems, in part due to inadequate appraisal and poor procedures for carrying out schemes. Between 1964 and 1981, IDA lent US$ 135 million for 17 projects, mainly to build boats and port facilities, but such capital intensive schemes ran into difficulties because catches were overestimated, engines were inadequately selected, there were delays, bad design and construction, overestimated demand for new boats, non-availability of skilled labour and bad management. This experience is quite normal with regard to large investments in the fishery sector. Consequently, IDA has set its aims on increasing productivity and income of fishermen through generally avoiding the capital-intensive activities. As fishing operations become more sophisticated and capital intensive, it can be irresponsible of advisers to recommend that costly investments be undertaken in the fishery sector when the infrastructural, management and overall absorptive capacities are insufficient.

Sometimes the actual catching process is not the only way, and is often not the best way, of obtaining benefits from a fishery. In many countries, it is the ancillary activities, from vessel construction and maintenance,. through the supply of fuel, etc., to fishermen, to the processing and marketing that gives the best (and easiest) returns. Certain States may well find it more attractive to ensure that they get a full share of the ancillary activities, rather than of the sea-going work, which can be undertaken by distant water fleets (often subsidized through foreign investments) and through licensing arrangements.

It is apparent that with regard to many stocks (often the more valuable species), the main emphasis of Government policy should be toward controlled management rather than active encouragement of exploitation. Some Government investment in port facilities can be recommended, but experience has generally shown that the private sector is well able to judge the soundness of investments in the catching and processing sectors. However, governments can often play a useful role in providing small grants, credits and technical assistance to assist underprivileged groups/individuals to enter the sector.

Whatever objectives the Government eventually practises, there are clear advantages in encouraging diversified skills and operations, so that the sector can take advantage of

whatever opportunities may be offered (in terms of sudden fluctuations in stock, cost and price differentials, market openings) for the different species available to the sector. There are also considerable advantages of close cooperation between neighbouring states, if not at the political level, at least at the business/trading level so that, for example, fish marketing can be improved, as separate ports become established centres of processing and marketing of certain species).

The role of the planner is to identify these conflicts where they occur (including processing as well as fishing) and provide decision-makers with as clear an assessment of the alternative courses of development as possible.

MAN, STATE AND FISHERIES
AN INQUIRY INTO SOME SOCIETAL CONSTRAINTS THAT AFFECT FISHERIES MANAGEMENT

by

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ABSTRACT

This paper examines how fisheries management can be affected by economic, political, cultural and social factors that can occur at three levels: international, national and individual. The international level includes technological transfer, fluctuation of prices, jurisdiction, loans, etc. The national level includes overall government policy, changes of administration, etc. while the individual level refers to one's view of Society's relationship to nature; one's view of the renewability of marine resources and one's ideological perspective.

INTRODUCTION

Fishing is not only an economic activity, but is a political, cultural and social one as well. Therefore, to understand how a particular fishery has been managed requires investigations by social as well as physical scientists.

The purpose of this paper is to identify some of those factors that might impinge on the implementation of rational management strategies for living marine resources. We will focus on the Peruvian anchoveta fishery which underwent rapid growth and development, beginning in the early 1950s. An analysis of influences on the exploitation of the Peruvian anchoveta can provide valuable insights into the management of similar stocks elsewhere.

One can find views in the literature that relate the successes and failures of fishery management to either activities at the international level, group behaviour at the national level, or individual behaviour. This paper treats these three levels as analytically distinct categories of factors that affect rational fishery management. This is an attempt to present a new way of evaluating existing information about the different factors that affect fisheries management.

THE INTERNATIONAL LEVEL

Even when the international community is not directly involved in the exploitation of a national fishery, the fishery will surely be affected by technology transfer, fluctuating commodity prices and so forth, that result from the actions of other nations.

Such factors can affect the supply of fish and might include, for example, technology transfer (including technical advisers), jurisdiction over coastal waters, the need for foreign exchange, and international development assistance loans. They can also affect the demand for fish products and might include such factors as international market demands, competition from other fisheries, and international prices for fish products. A third set of international factors encompasses aspects that do not appear to relate directly to fisheries management and can include, for example, international reactions to the expropriation of foreign investment in sectors other than fishing, the seizure of foreign fishing vessels, or even the demise of a fishery thousands of miles away. Each of these can affect the development of fishery.

Underlying these international considerations one finds differing, often opposing, ideological beliefs which may agree, for example, that a specific activity transpired, but will disagree as to its causes or consequences (for an example of such debate see Malpica, 1975 versus Tantalean, 1978).

One of the important aims of this section is to question the belief that what happens in one fishery is of little consequence, except in the marketing sector, to other fisheries in other regions exploiting different stocks. The Peruvian situation suggested that the rapid development of its fishing sector was precipitated by the collapse of the Californian pacific sardine fishery which had also been a factor in the development of the South African pilchard fishery.

Today we see a repetition of that historical experience. Peru is now attempting to sell its surplus catch and processing capacity to the international community, and South Africa, following the collapse of its own pilchard fishery in the late 1970s, has become directly involved in the exploitation of Chile's pilchard stocks.

THE NATIONAL LEVEL

This section focusses on national-level activities that take place in a given country that might influence the management of a fishery; for example, the issuance of government decrees related to agrarian reform, worker strikes in the mining sector, policies toward exchange rates (encouraging or discouraging foreign investment), government nationalization of foreign investments that are unrelated to the fisheries. The fishing sector is a subsystem embedded in a larger political and economic system. In order to understand how the fishery is managed, it is necessary to be aware of that larger context.

Competing interests can adversely affect the management of a living marine resource. It is necessary to recognize that "there are different classes of objectives - biological, economic and social - as well as different time horizons over which objectives might be obtained". Each of these objectives, if followed, could lead to a different pattern of harvest and exploitation.

To date, there have been a dozen changes of government (elections as well as military takeovers) in Peru since 1939. On several of these occasions new governments pursued policies affecting the fishery that were major (if not drastic) changes from those of their predecessors, especially in 1948, 1968, 1975 and 1980.

Changes within government can also affect fisheries management. For example, during the Belaunde administration (1963-68) there were seven holders of the Finance Ministry portfolio. This may be an important consideration for why the same resources in the same country may have been managed in different ways, and is an aspect that is seldom addressed explicitly at technical meetings on fisheries management.

THE INDIVIDUAL LEVEL

Individuals have different, often conflicting, perceptions of those events that take place around them and those perceptions become their reality. While they may not prove to be accurate reflections of reality, the actions taken based on them will be real, as will be the consequences of those actions. Three important considerations that relate to fisheries management at this level are (a) one's view of society's relationship to nature, (b) one's view of the renewability of living marine resources, and (c) ideological perspectives.

Man-Nature Relationship

There are many conflicting views about what the relationship between man and nature should be. Two major views emerge: man-over-nature and man-in-harmony-with-nature. Most leaders in developed as well as in developing countries tend to pursue policies of development that are manifestations of the man-over-nature belief.

Renewability

Most observers categorize fish as a renewable resource, probably because they are self-generating. Pelagic fish populations, however, have collapsed in the recent past. Notable examples of such collapses are the Peruvian anchoveta, the South African pilchard, and the Californian Pacific sardine. Might fish populations of a particular kind, in a specific region, and during a specified period of time, be considered non-renewable sources? Perhaps there is now enough evidence to suggest that pelagic fisheries be treated as a non-renewable resource, if under adverse conditions they can disappear.

Ideological perspectives

Opposing ideologies exist and that existence must be accepted even if the contents of a particular ideology are not. Observers with differing ideological perspectives assess interactions between different goups, and nations in profoundly different ways. For example, while an observer might note that foreign investment in a fishmeal processing plant in a developing country was designed to yield profits for both national and foreign entrepreneurs, another might view the same activity as an attempt by a developed country to gain access to the natural resources of the developing country.

Concluding Comments

Fisheries management is affected by many factors that occur at the three levels of social organization discussed in this paper. While some of those factors are obvious to those involved in fisheries, others may not be so obvious. It is extremely important that those directly and indirectly responsible for the management of a fishery be aware of the complexities of the larger political and economic system of which their sector is a part and to which their sector is integrally linked.

THE ROLE OF ARTISANAL FISHERIES WITHIN THE FRAMEWORK OF POLICIES, STRATEGIES AND PROGRAMMES FOR FISHERIES DEVELOPMENT THE CASE OF WESTERN AND CENTRAL AFRICA

by

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ABSTRACT

This paper looks at the present situation of small-scale traditional fisheries in Western and Central Africa and outlines future objectives and strategies from the nutritional and socio-economic aspects. Action programmes are suggested for development of the traditional fishery.

INTRODUCTION

In Africa the exploitation of fishery resources is often linked to developments in two sectors:

(a) traditional fishery, which is entirely in the hands of the local populations, using light vessels operating from a multitude of small villages. This fishery accounts for 80 percent of national landings and largely meets local consumption requirements;

(b) modern fishery, using industrial techniques and based on a few large ports, the (real) owners of which are foreigners. This fishery gives rise in some countries to an advanced industrial activity which often does not merge well into the national economic structures.

In this document we shall study:

(i) the present situation fo small-scale fisheries considered as the result of traditional fishery and of experiments during the last twenty years or so;

(ii) development objectives and strategies of small-scale fisheries in the light of the above results;

(iii) finally, the programmes of action for modern artisanal fishery within the framework of these strategies.

THE PRESENT SITUATION AND THE RESULTS OF EXPERIMENTS DURING THE PAST TWENTY YEARS

Fishery development in Western and Central Africa is the result of the conjunction of two extremely favourable factors:

- the geographical position of the countries, at a point where there are big ocean currents that generate conditions favourable for the existence of a great many species;

- the rapid growth of populations which are big consumers of fish enabling full advantage to be taken of a natural bent for fishing.

To these factors should be added the presence of a network of rivers and lakes from which many waterside villages draw their essential supplies of proteins.

Table 1

Results of marine fishery between 1970 and 1980 (in '000 t) in the countries of West and Central Africa[a/]

Fisheries	Volume of catches[a/]			
	1965	1974	1978	1980
- Artisanal	114	353	629[b/]	592[c/]
- National industrial	14	187	361[b/]	380[b/]
Total	128	540	990	1 072

a/ Excluding Morocco

b/ Corrected figures for Senegal (Source: CECAF documents)

c/ Estimates based on the 1978 figures and the overall results for 1980

Examination of Table 1 makes it possible to draw the following conclusions. In 15 years landings by the traditional artisanal fishery increased in weight by 500 percent. In several countries (Senegal, Mauritania, Guinea-Bissau, etc.) growth was higher than in any other economic sector during the same period. These results were made possible by the introduction of small technical innovations (outboard motors, surrounding nets, etc.) and an increase in the traditional fishing gear available. As regards national industrial fisheries, they experienced more downs than ups. In all countries their average growth is considered catastrophic, given the investments made, which are, for the countries concerned, enormous, and which have often consisted of unsuitable, obsolete, second-hand vessels that cannot meet the requirements of the countries concerned because of the high costs of fuel, refrigeration, spare parts, etc.

In conclusion, the above figures and conclusions that can be drawn from them show that fishery as a whole is an economic sector full of promise for the maritime countries of Western and Central Africa. The positive results of the traditional artisanal fishery reveal the efforts made by governments to organize and equip this sector, and also indicate that further progress can be made in the sector through the mass of induced effects resulting from the interaction between fishery and other economic and social sectors.

OBJECTIVES AND STRATEGIES FOR DEVELOPMENT OF SMALL-SCALE FISHERIES

The objectives and strategies are of two kinds: nutritional and socio-economic (maintenance of employment, increase of income).

Nutritional Aspects

The present situation described above shows the possibilities for fisheries development in most of the countries bordering on the Eastern Central Atlantic. Careful examination of the table in Appendix 1 on the quantities of fish (national production and importation) makes it possible to draw the following conclusions:

(a) Of the twenty or so coastal countries concerned, eight have a consumption per head of less than 12 kg/year[1/]. The number rises to ten if imports are subtracted (17 percent of the fish consumption in the region as a whole).

1/ *Per caput* consumption refers to national average, taking into account that fish consumption is higher in coastal areas

(b) The share of maritime sources is about 70-75 percent as against 25-30 percent for inland fisheries (although the latter represents 40 percent in Nigeria, almost 100 percent in Zaire, 80 percent in Benin, 60 percent in Cameroon, etc), except in Senegal, Guinea, Cameroon and Nigeria.

Objectives

The amount of animal proteins available from sources other than fish is very small (less than 15 kg/person/year). It can, therefore, be appreciated that fishery products are of vital importance in supplying the animal proteins required by the population. In order to reach an acceptable level of animal protein intake with only half of it from fish products, at least 22 kg of fish per person per year would be needed. Eight countries attain this figure if imports are included, only five can do so withouth imports. For the region as a whole, supplies (national production plus imports) should be 3 700 000 t as against 2 million tons in 1980. Given the resources available and the functions fulfilled by the foreign fleet (2 500 000 t caught in and exported from this region)[1/], it is fully possible for many countries to make progress that would enable them to increase national production considerably.

Strategies

In order to meet the requirements of populations with low purchasing power, governments have two solutions:

(i) a solution with little economic significance but important from the social point of view: to make the best possible use of the local fishery by equipping and/or modernizing it in order to increase its productivity and by developing methods for preserving, handling and storing the catches as effectively and cheaply as possible in order to improve marketing of the products;

(ii) to import fishery products whose prices would be accessible to the people. The drain of foreign currency that this solution would entail means that it should be used only to make up supplies and should, as far as possible, be limited in time when possibilities exist of increasing local production.

Socio-Economic Aspects

Objectives

In several countries there are populations whose only main activity is fishing or related work (handling and trading). These populations, which live directly or indirectly on fishing, represent 10 percent of the local population (case of Senegal). In some countries fishing, therefore, represents a sector of employment that should at least be kept at its present level while improving the standard of living of the fishing communities.

Strategies

Two solutions are possible:

(i) to keep the traditional fisheries at artisanal level and improve catches through the regular supply of fishing gear - a solution of exceptional social value;

(ii) to pass to the stage of a more advanced fishery (modern and industrial). This solution, which often counts on exportation, requires careful organization and relatively large investments in catching, storage and processing procedures if the products are to be turned to maximum account and produce the maximum amount of induced effects and currency.

1/ 1980 - Source: CECAF

PROGRAMME TO BE IMPLEMENTED WITHIN THE FRAMEWORK OF STRATEGIES FOR THE DEVELOPMENT OF ARTISANAL FISHERY

The results already obtained show the possibilities for developing artisanal fishery and the importance that this can have for fisheries development in Western and Central Africa. Any strategy must aim first at increasing the catches of the traditional fishery and then at accelerating the process of modernizing this fishery while maintaining employment (as much as possible).

Increasing the Productivity of the Traditional Fishery

In order to attain this objective, a series of actions should be programmed:

(a) introduction and widespread distribution of technical improvements, e.g.:

- motors to enable the small fishermen to fish over wider areas;
- the construction of more efficient vessels within the means of the fishermen in order to increase their income;
- the installation of small workshops for repairing and maintaining the motors in order to ensure full utilization of the production equipment;

(b) establishment of fishery financing and assistance bodies to enable the small fishermen to obtain equipment and to make their way into moder economic channels;

(c) provision of facilities for handling fishery products and organization of a trading network, for example:

- construction of access roads connecting the country's major routes with the landing sites;
- construction of channel entrances to the beach sheltered from the surf and from other natural constraints that limit the movements of the vessels;
- provision of cold stores in fishing sites in or near towns in order to ensure better marketing of fresh fish;
- provision of drying equipment and ovens to enable the fishermen to obtain the best return on all their products. If necessary, a marketing organization should be responsible for distributing the products;
- provision of necessary amenities in "seasonal" fishing villages (wells, fuel depots, medical pots etc.);
- provision of conservation and storage equipment in town markets to ensure that the products are sold under hygienic conditions.

Accelerating the Process of Modernizing the Traditional Fishery

It is often essential to modernize certain artisanal fisheries if yields, and hence the income of the fishermen and the effects on the overall economy, are to be increased. In order to achieve this objective infrastructures and new equipment must be introduced, and the fishermen organized into units able to use jointly the new means placed at their disposal.

Introduction of Infrastructure and Equipment

Handling facilities in the ports must be improved and deconcentration effected to enable the important centres of traditional artisanal fishery to play a more important role in fisheries development. These handling facilities (including landing, storage facilities) if spread along the coast would make possible optimum use of the zone accesible to coastal fishery.

Introduction of Modern Artisanal Vessels

Traditional vessels with the present characteristics quickly reach the limits of their performance. It is, therefore, necessary to introduce new vessels which, although adapted to artisanal fishing, will be more economical because more efficient, and autonomous enough to be able to fish a wider area.

Once the prototype has been perfected cooperatives of boat-builders will have to be set up to build small fishing boats in series. The government would be responsible for building the equipped boatyard.

Financing of Constructions

In order to ensure that the new vessels are widely used, measures should be taken to ensure that the fishermen make a good choice. The low purchasing power of the fishermen makes it necessary for facilities to be accorded for the acquisition of new equipment, in two forms:

- a Government subsidy to fishermen who so request (skipper or group of fishermen) for bigger boats, as happens in all boat-building countries;

- a medium-term loan, for which the fisherman will have to demonstrate his goodwill by paying a share.

Pursuit of Research and Training

The development of a new fishery makes it necessary for special efforts to be made in scientific and technical fishery research:

- various programmes on the state of the resources and their management, and actions, of a practical nature to improve fishing results;

- professional training to enable the best use to be made of the new techniques.

APPENDIX 1

Catches and *per caput* Consumption
In West and Central Africa

	Population (millions)	PM	PC	T/PN ('000 t)	IMP	T/DISP	T/PN *per caput* kg/year	T/DISP *per caput* kg/year
Benin	3.4	5	21	26	11	37	7.6	10.9
Bissau	0.8	5	1	6	-	6	7.5	7.5
Cameroun	8.2	19	40	59	15	74	7.2	9
Congo	1.5	20	1	21	7	28	14	18.7
Gambia	0.6	10	1	11	1	12	18	20
Guinea	5.3	18	1	19	15	34	3.6	6.4
Ghana	11.2	187	42	229	76	305	20.4	27
Ivory Coast	8.1	62	17	79	105	184	9.8	22.7
Liberia	1.8	8	4	12	16	28	6.7	15.6
Mauritania	1.6	21	13	34	-	34	21.3	21.3
Nigeria	82.5	292	200	492	63	555	6	6.7
Senegal	5.5	254	25	217	-	279	50.7	50.7
Sierra Leone	3.4	34	1	35	8	43	10.3	12.6
Togo	2.5	5	3	8	8	16	3.2	6.4
Zaire	27.5	1	114	115	45	160	4.2	5.8
Angola	6.6	100	50	150	9	159	22.7	24
Gabon	0.8(9)	20	2	22	4	26	27	32.5
Cape Verde	0.3	8	-	8	-	8	26.7	26.7
Equatorial Guinea and Sao Tome	0.5	3	-	3	1	4	6	8
	165	1 072	536	1 608	384	1 992	9.7	12.0

Source: Documents CECAF/FAO/1982
PM : Marine Fisheries
PC : Inland Fisheries
T/PN : Total National Production
IMP : Imports
T/DISP: Total Fish Available

SMALL-SCALE FISHERIES IN THE STRATEGY FOR FISHERY DEVELOPMENT IN THE ASIA-PACIFIC REGION

by

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ABSTRACT

This paper looks at why small-scale fisheries continue to be so important in the Asia-Pacific region despite the extension of the EEZs and raised questions about what constitutes "appropriate" technologies for development and what type of organizational forms are called for in view of the socio-cultural importance of small-scale fisheries as a whole.

INTRODUCTION

The term "small-scale fisheries" can be stretched to include a very wide variety of fishing operations. In this paper it is used primarily to refer to the large artisanal fisheries sector and also the equally large, but relatively new, motorized fisheries sector in the Asia-Pacific region.

This paper has been written only to provide a starting point for discussions on a subject which now engages the mind of persons the world over concerned with fisheries. It only proposes to suggest some perspectives and raise a few questions - some direct, some implied - on certain important issues which are of concern in the region familiar to the author.

BACKGROUND

With the endorsement of the Law of the Sea Convention in December 1982, vast expanses of the ocean have become a mosaic of national control. This provides the opportunity for establishing both the rights and responsibilities with regard to the waters surrounding a nation and any resources therein. It also provides the basis for both cooperation and conflict.

The developing countries in the Asia-Pacific region are, by and large, faced with a dilemma: they exercise control over expanded territory but are largely without the technology to exploit the resources or the policing power to guard them from plunder. Fish is not the resource of highest potential economic value in this new territory. Yet from the point of view of food and employment (both crucial issues in these countries), and also considering the broader social and cultural concomitants, the fisheries sector's role cannot be undermined.

On a broader plane, the development experiences of the countries in the Asia-Pacific region have also to be kept in mind. About three decades ago, starting from different "initial conditions" they adopted a wide spectrum of economic policies based on different political orientations. The dynamics of development have led to great changes in the internal structure of these economies. By and large, it has been the quality of interaction with the "outside world" that has determined the direction of this change. In general, however, the results have been the attainment of varying degrees of success in providing the means for the socio-economic and human development of their vast populations. The task remains unfinished, and in some countries it has become more complicated. Great expectations hold forth for the coming years.

These generalizations are equally valid for the fish economies of this region and it is against this background that any discussion on the strategies for fisheries development and the role of the small-scale sector within it, become both complex and challenging.

THE SMALL-SCALE FISHERIES SECTOR: SOME ISSUES FOR DISCUSSION

In a sense, it is a contradiction that following the expansion of rights over the seas to a 200-mile exclusive Economic Zone, a renewed emphasis should be placed on a small-scale sector of fisheries which by and large confines its activities to the 12-mile territorial waters.

We can perhaps consider four ways of looking at this:

- first, as a tacit admission of the failure of an earlier approach/strategy;
- second, as an honest attempt to bring some fresh perspectives and sharper focus to small-scale fisheries development;
- third, as a solution by industrialized countries to the problem of getting fish, having now lost "free access" to the seas;
- fourth, it could be a bit of all the above!

However, be that as it may, the fact remains that in spite of all this, the small-scale fisheries sector of the region has and will continue to maintain its position of primacy.

Several factors can be attributed for this and we need to examine some of the perspectives and the constraints.

An Overriding Factor: Nature's Bias

Ninety percent of marine life is concentrated in ten percent of the waters above the continental shelf and coupled with this, in the tropical waters of the region there are several thousands of fish species but each in smaller quantities than one finds in temperate waters. This biological determinism makes for Mother Nature's bias in favour of a smaller-scale of fishing operation in the region. Irrespective of changing economic and political perspectives, this is a determinant that will undergo little change.

Mass Needs: Cheap Protein and Widespread Employment

The estimates of malnutrition in the region reckon that between 30 to 60 percent of the population can do with more protein to maintain activity levels commensurate to their occupation and age. With the increasingly adverse man-land ratio, emphasis on the ocean as a source of protein becomes paramount. This, coupled with the chronic capital scarcity in these countries, makes the need to achieve high protein-capital and protein-cost ratios a desirable objective. Juxtaposing this with nature's bias, in the realm of capture fisheries, the role of small-scale operations turns out to be both economically viable and socially desirable. Considerable evidence to reinforce this view in different country settings is now available.

More widespread employment is a dire need of all the developing countries of the region. The decentralized beach-landing type of small-scale fisheries operations so characteristic of the region ensures a spatially dispersed pattern of employment generation. Such a spread detracts from the trend toward centralization in the name of economies of scale and also helps to stem the growing migration from the impoverished peripheral rural, coastal areas to inland, urban settlements.

It may be appropriate to discuss the contention that there is an inextricable link between the decentralized small-scale operations, optimizing employment prospects and providing cost-competitive supplies of protein for the local populations.

BASIS FOR PROGRESS: TECHNOLOGY AND ORGANIZATION

Two realms where much of the planned small-scale fisheries development have centred are technology and organizational forms.

Technology

Technology was once held out to fishermen as their chief hope, but among most small-scale fishermen of the region, the kind of technology that was propagated has turned out to be their greatest fear.

The new wave of "intermediate" and "appropriate" technology came in the wake of this widespread fear. However, even now the major barrier seems to be that even these "soft" technologies are not appropriable techniques, i.e., they are not techniques which small fishermen can take ownership and control of and master in the economic and socio-cultural sense.

We need to raise a few questions in this regard. Is appropriateness to be measured only in terms of physical scale? What does a technology do to socio-cultural networks, work and production relationships? What does it do to the accumulated skills of most small-scale fishing communities? In this context, should not the whole exercise of the dynamics of the generation of new technologies be reviewed, particularly with an emphasis on drawing from the vast reserves of "endogenous" scientific capabilities among the fishermen themselves?

A technological breakthrough is of crucial importance considering that the raising of productivity - both of labour and capital - is an inescapable necessity if the small-scale fisheries is to play the dominant and desirable role within the fisheries sector of the developing countries of the region. Technological alternatives need not only be confined to improving craft and gear stressing on economic efficiency criteria alone. The potentials of enhancing the ecological productivity/efficiency by appropriate mariculture techniques may need to be seriously considered.

Organization

Organizational forms, introduced once as the vehicles of fisheries development, have also crashed along the road. The plight of fisheries cooperatives the world over is too well-known to be repeated here. To the small-scale fishermen the word "cooperative" has an odour worse than that of rotten fish. Questions we need to examine here should relate to the functional as well as the sociological and political causes for failure.

Organizations need to be viewed as essential elements in achieving techno-economic and social progress by meshing into the fabric of the development process. They should become the means to make the fishermen owners of their own work - masters of the product and of the process of production, including the scientific basis on which it is organized.

Whether it be credit unions, extension projects or training programmes, the need for a greater people-orientation is called for to ensure more lasting effects.

NEGLECTED AREAS: DATA COLLECTION AND RESOURCE MANAGEMENT

An area where more attention needs to be focused is the arena of socio-economic data collection. With community involvement, these should form the basis of any plans and strategies that seriously and earnestly propose a bias toward small-scale fisheries. Here, as has now become the accepted practice in the agriculture sectors, emphasis should be laid on the "distributional" dimensions - Who owns gear? How many? Who works? Who bears costs? How are earnings divided? - rather than be preoccupied with aggregates. Only such information will highlight the dynamics within the sector and expose its heterogeneity - a factor which many fail to recognize.

Much needs to be said about the innate consideration which small-scale fishermen have for conserving resources and maintaining an overall ecological balance. However, confronted with "intruders" raping their fishing grounds, it is hardly surprised that they adopt the "fish today to survive tomorrow" attitude. The "catch-22" about Mother Nature's bias in the tropical waters is that even at low levels of catch efficiency, an exorbitant increase in the number of operators can result in overfishing - economic and biological.

The possibilities of an exclusive economic zone for small-scale fishermen (a demand being strongly voiced by them in many countries) within which appropriate forms of territorial use rights in fishing (TURFs) can be adopted, needs to be discussed.

The essence of managing a resource must not, however, overstress the needs to establish property rights over it. The prime concerns involved in utilizing a resource must be to maximize social good rather than private profitability. In this process, a whole spectrum of conflicting objectives may have to be examined.

PERSPECTIVES FOR THE FUTURE

In the region, the small-scale fisheries sector personifies the efforts of a people striving to survive.

The ingredients of this struggle have in the past included the ethics of self-sufficiency; a working symbiosis between people and environments; biological, economic, and socio-cultural diversity; and the focus of the fruits of labour on meeting the basic needs of people.

To a great extent, while we look ahead, keeping options open for the future will mean weeding through the old to bring forth the new.

THE ROLE OF COOPERATIVES IN THE EXPLOITATION AND MANAGEMENT OF COASTAL RESOURCES IN JAPAN

by

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ABSTRACT

This paper describes the historical development of fishery cooperatives in Japan since 1884 and their present classification and organization. The role of the sea area fishery cooperatives (the largest category) is described with reference to their administration of fishing rights; their economic activities; and their role with the arrival of the EEZ.

INTRODUCTION

One of the secrets of the development of Japanese fisheries lies in the fishery cooperative organization and initiatives of fisherman through fishery cooperative activities.

Fishery cooperatives in Japan were established originally with the purpose of carrying out the administration of fishing rights in coastal waters. In that sense, they have distinct characteristics as compared with cooperatives in other fields. Thereafter, the fishery cooperatives expanded their activities into economic fields, as Japanese economy and fishery activities developed. However, the function of administering fishing rights has still been maintained firmly as one of the activities of the fishery cooperatives. It has a great influence on their activities, and at the same time, sometimes creates constraints for the cooperatives' development.

In Japan, fishery cooperatives form the centre of fishing villages and play an important role in many sectors, such as: marketing, support and credit activities, training, as well as management of fishery rights and collaboration with the responsible administrative agencies in the management of licensed fisheries, and the important task of channelling information on rules and regulations and other fishery-related information from the Government to the fishermen.

The contribution of fishery cooperatives for the development of fisheries, especially coastal fisheries, was so great that the prosperity of fisheries today might not have been achieved if organizations like the cooperatives had not existed.

The prototype of controlling fishing grounds in the coastal areas through fishing rights and licensing system through cooperatives were founded in the feudal period. Modern fishery cooperatives established in the early twentieth century have kept the shadow of the feudal age. In the course of years, however, democratization of the cooperatives has progressed through various kinds of difficulties, such as serious conflicts between offshore fishermen and inshore fishermen, and economic constraints in the fishing villages caused by the Great Depression in 1929 and the second world war (1941-45).

SHORT HISTORY OF FISHERY INSTITUTIONS AND FISHERY COOPERATIVES

It may sound strange that the first substantive action toward fisheries by the new Government after the Meiji Restoration in 1868 was the establishment of "Standard Rules for Fishery Association" in 1884. With the collapse of the feudal system at the time of Tokugawa shogunate, the order of fisheries in the fishing villages was also destroyed, and some replacement measure was needed to keep order.

Fisheries in the Tokugawa shogunate were managed in the following manner. In the early Tokugawa shogunate, villages along the coast were classified into two categories: "Jikata" (farming village) and "Urakata" (fishing village). People in the farming village were engaged solely in agriculture, fishing activities being prohibited to them except for the collection of seaweeds to be used as fertilizer. People in fishing villages were allowed to engage in fishing activities upon payment of a tribute to the feudal lord. The extensive coastal area in front of local villages (including farming villages) were "common fishing grounds" for the related village people. In the waters beyond the coastal sea areas, large-scale fishing boats were operated by people who obtained fishing licenses from the feudal lords upon payment of tributes.

In addition to the two types of fisheries mentioned above, special licenses for some limited type of fisheries such as whaling, trap fisheries, beach seining, were granted by the feudal lords to individuals such as landlords and merchants, in return to payment of tributes. The policy which drastically separated fishing villages and farming villages along the sea coast originated from the philosophy that agriculture was fundamental to the country and farmers should concentrate themselves on agricultural activities.

However, in the middle of the Tokugawa shogunate, such a separation had been gradually abolished and farming village people acquired fishing rights in their coastal sea areas. This was attained, however, by breaking through the strong opposition of fishing village people who claimed that such a gain encroached on the vested rights of fishing village people.

In the later Tokugawa shogunate, owners of the larger boats formed guilds and leaders of fishing villages were ruled by the feudal lords through the guilds.

The purpose of the "Standard Rules for Fishery Association" in 1884 was to establish new mechanisms for the utilization of fishing grounds and to replace the guilds system in the Tokugawa shogunate. We can find the prototypes of what we now know as coastal fishing grounds controlled by common fishing rights through cooperatives, trap fishing rights and licensing systems.

In 1901 the Fisheries Law, a basic law for fisheries, provided for fishing rights, fishing licenses and fishing cooperatives which could manage fishing activities as well as administer fishing rights. The Fisheries Law also accounted for modern fishing enterprises which would develop offshore and long-distance fisheries.

An amendment to the Fisheries Law in 1910 enabled the fishery cooperatives to carry out economic activities, including fish marketing, in addition to the administration of fishing rights.

Notwithstanding various institutional arrangements which were provided to fishermen, almost all of them were struggling under the hands of fish wholesalers/dealers.

In the course of the 1920s and 1930s, serious conflicts arose frequently between offshore and inshore fishermen and the economic constraints brought on by the Great Depression in 1929 and the second world war destroyed fishery activities in Japan. In order to keep peace and order in the fishing community, and foster the fishery cooperatives as the principle organization of fishery activities in the coastal areas, the Government established a policy to concentrate all fishing rights (including demarcated and trapnet rights) into the hands of fishery cooperatives. The Government also encouraged the cooperatives to have their own fish markets where bidding was carried out to ensure fair prices of fishery products. Through these series of actions by the Government, fishermen and fishery cooperatives gradually increased their power and were able to compete with wholesalers/dealers/processors on equal terms. Ironically, under the controlled war economy during the second world war, exploitation of fishermen by wholesalers/dealers/processors was totally eliminated.

In 1946, one year after the second world war, a major revision of the fisheries legislation was carried out by the Government under the direction of the General Headquarters. In this revision, the following three points were important:

(1) fishing rights and licenses were granted only to fishermen or fishing enterprises actually engaged in fishing, and leasing arrangements were prohibited;
(2) as a principle, administration of fishing rights were entrusted to fishery cooperatives or similar organizations;

(3) fishery coordinating committees were established for each sea area. These committees were to draw up overall plans for fishing ground utilization for the respective coastal waters and, based on these plans, fishing rights and licenses were to be granted to fishery cooperatives, other bodies and to individuals.

Since the fundamental revision of the Fisheries Law in 1946, 35 years have passed without any major modifications.

GENERAL CLASSIFICATION OF FISHERY COOPERATIVES

Fishery cooperatives in Japan are classified in two categories: (a) area cooperatives and (b) specific fisheries cooperatives (e.g., tuna longliners, offshore dragnet fisheries). Area cooperatives are divided into sea area and inland water.

As of 31 March 1981, the total number of fishery cooperatives amounted to 3 380, of which 2 165 were sea area; 918 inland water; and 297 specific fisheries. In addition, 819 fish production cooperatives (seisan-kumiai) and fish processors' cooperatives also existed under the Fishery Cooperatives Law.

The role and the status of fisheries cooperatives are outlined in the following two organization charts:

CHART I

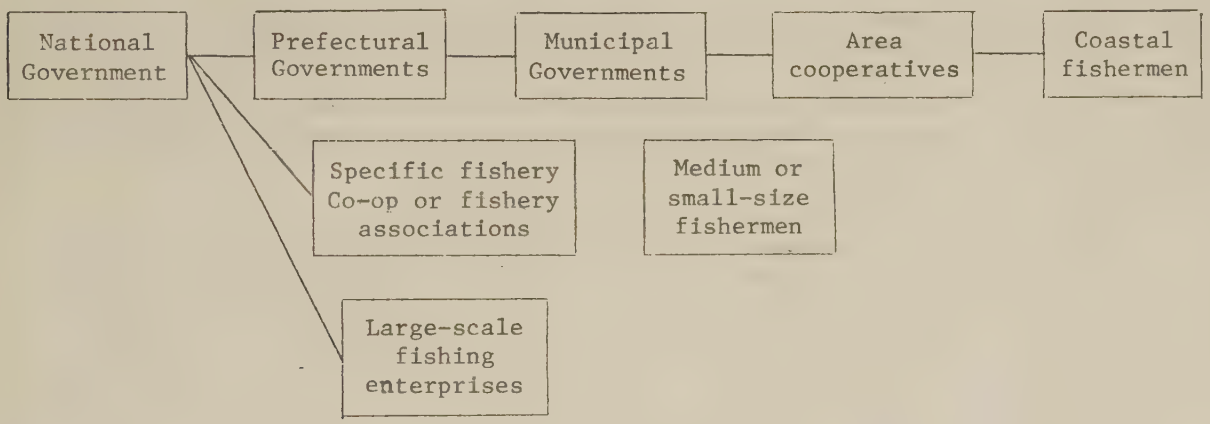
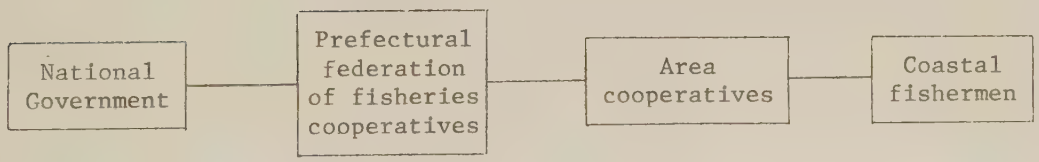


CHART II



National Government orders, instructions and guidelines are delivered through the channels shown in Chart I. Subsidies and assistance programmes provided by the National Government to coastal fishermen pass through the channels in Chart I. Prefectural Governments also assist fishermen according to independent and cooperative programmes with the National Government.

Close relationship through consultations have been maintained between the National and Prefectural Governments, the National Government and the National Federation of Fishery Cooperatives Association and the Prefectural Government and Fishery Cooperatives on such

fishery problems as those concerning the drawing up and implementation of new legal institutions, fishery projects, budgets, subsidies, financial assistance programmes, etc.

ROLE OF SEA AREA FISHERY COOPERATIVES

Some of the problems of the sea area fishery cooperatives (the most important fishery cooperatives among the four categories) are discussed herein below.

Administration of Fishing Rights

The fact that the sea area fishery cooperatives in Japan have maintained a high degree of participation by the fishermen is due to the fact that fishing rights have been granted to sea area fishery cooperatives and fishermen can only carry out fishing if they are members of the cooperatives.

Fishing rights are classified into three different types of rights: common fishing rights, demarcated fishing rights, and trap fishing rights.

The common fishing right is granted by the Government only to fishery cooperatives. This is the right to fish or collect animals or plants which are totally or comparatively immobile in the waters.

The demarcated fishing right relates primarily to aquaculture. Most of the demarcated fishing rights are given to fishing cooperatives except for pearl culture rights and large-scale net gauge.

Trap fishing rights may be granted to individual fishing enterprises as well as fishing cooperatives. However, first priority is given to fishing cooperatives.

Under the fishing rights, the cooperative establishes detailed rules and regulations for the use of the fishing right. The cooperative determines the opening and closing of the fishing season,the time of operation for each day (if necessary), fishing areas, fishing gear and the method of fishing permitted, etc, for each right.

In the practice of fishing right for aquaculture, the fishing cooperative fixes maximum scale of operation for one fishing household, divides the fishing ground into sections and allots these to each fisherman by drawing lots, and rotates the place for each fisherman every year. Care should be taken to ensure that impartiality be used toward every fisherman in the fishing right. It is one of the important targets of the cooperative activities that every member should enjoy equal economic benefits from the fishing grounds. Accordingly, the penalties for the infringement of the rules and regulations governing the use of fishing rights, or other agreements by the members of the cooperatives are very severe including expulsion from the cooperative.

A rational explanation of Japanese systems of fishing rights and licenses have been attempted by many people. In a situation where fishing villages are overpopulated in relation to the amount of fishery resources, fishing operations have to be adjusted, depending on the year, season and places, to synchronize with fluctuations of fishery resources. This could be one way of coping with such a situation and the systems are still valid today.

But the development of fishery resources in places where few fishermen live and the demand for fish is limited, may have to be carried out in quite a different way from that used in Japan.

Economic Activities

Fishery cooperatives have contributed substantially to the development of fisheries, expecially coastal fisheries, through economic activities such as the operation of fish markets, support credit services and the supply of credit facilities.

Fish marketing activities of the sea area cooperatives (mainly through the operation of their own fish market) have provided the economic basis for the activities of the cooperatives and the main source of their profits.

Support activities include the supply of fuel oil, fishing gear and equipment, freezing and cold storage. Some cooperatives operate radio stations, repair shops and fish processing plants. The cooperatives, in the remote areas where fishing activities are dominant, sometimes also operate supermarkets, and a nursery and kindergarden. However, the support activities of fishery cooperatives are generally not very profitable.

Cooperatives cannot purchase uniform articles in large quantities because the demands for goods by the fishermen are varied in both type and size.

Credit activities of the cooperatives are also important and are closely related to fish marketing activities because almost all of the sales of fishery products caught by fishermen are carried out in the fish market operated by the cooperatives. Area cooperatives and specific fishery cooperatives are also important when fishermen borrow money from the Agriculture, Forestry and Fisheries Financing Corporation and the Central Cooperative Bank for Agriculture and Forestry, since these require endorsement by the cooperatives or the members of the cooperatives before granting any loans.

FISHERIES AND THE ROLE OF THE FISHERY COOPERATIVES IN THE ERA OF THE 200-MI REGIME

The new 200-mi ocean regime has increased the importance of coastal and offshore fisheries which operate in the 200-mi zone around the Japanese archipelago. Accordingly, the role of fishing cooperatives, especially sea area fishery cooperatives, may be reviewed and re-evaluated.

At the same time considerable problems exist, e.g., how to save energy in fishing activities to counteract the exorbitant rise in oil prices; how to harmonize coastal and offshore fisheries with the recreational fisheries which have greatly developed and have caused conflicts with coastal and offshore fishermen; how to prevent poaching in the coastal area; how to maintain and increase demand for fishery products to compete with the prices of other animal protein; how to provide a better living environment in the fishing village and secure income and standard of living of the fishermen to compete with those of people living in urban areas, etc.

On the other hand, the elevation of fishing to a status above the hunting of a wild animal seems to offer hope for the future. Some success has been achieved in the form of aquaculture such as salmon propagation and the successful seeding of scallops.

Trials to increase marine fishery resources through the formation or improvement of their living environment by the construction of fish shelters for nurseries, accelerating the replacement of water in a closed or semi-closed system, have also been carried out, and some success has already been obtained. Mass production techniques of seedlings have progressed enormously in recent years and attempts to develop these techniques into one system have been carried out in the form of "fish farming".

An urgent question to be tackled as the next step will be to review fishing rights and licence systems as determined in the Fisheries Law, and the role of the fishery cooperatives in this context.

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PLANNING, SCIENTIFIC AND TECHNOLOGICAL RESEARCH FOR FISHERIES DEVELOPMENT IN DEVELOPING COUNTRIES

by

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ABSTRACT

Decisions on scientific and technological research policies for fisheries must be in accordance with the national development plan and this paper suggests how vertical and horizontal dimensions of the technology spectrum can be placed in a matrix structure, with letters assigned to the cells, which makes it easier for the planning authority to choose suitable groups of projects in the sector for development and thus avoid dispersal of resources through overlapping research, etc.

Sectorial planning must consider the fisheries resource in its double aspect of a natural resource calling for rational administration as well as a source of animal protein which the national population is lacking. In developing countries fisheries can only be considered with an integrated planning perspective and linked with a national development policy.

The aims of fisheries development planning must be in conformity with the general food policies. Therefore, the increase in the domestic fish supply and the demand should become a part of a global food supply policy.

Moreover, the production of income and generation of employment in the fishing sector must be in accordance with a national labour employment policy and a policy of income distribution, particularly when the effects of the world crisis are strongly felt in the developing countries.

The increase in the demand for fish should lead to the diversification of fisheries as well as to the exploitation of new fishery resources, giving advantage to those catches requiring less consumption of fossil fuel.

It should be pointed out that, in recent years, third world countries were the target of the massive and abusive application of "hard" technologies in all sectors of the economy; that there is a devastating land occupation in coastal areas, mangrove swamps, estuaries and lagoons, as well as river basins, lakes and dams; that the expansion of rapid economic growth models, unable to generate employment, has led these countries towards an irrational concentration in major urban centres, bringing about pollution and the depletion of non-renewable resources at a rate and extent never known by other countries. It should also be pointed out that, within this framework, one of the main objectives of fisheries planning is the establishment of a policy for the conservation of water and hydrobiotic resources, i.e., trying to keep fish production at acceptable levels, and raising them when possible, but according to criteria of sustained harvesting.

This being so, a policy for the development and management of fishery resources and their habitats must be integrated with policies of expansion of agricultural frontiers, management of urban centres, industrial development, tourism, housing, etc. which once again requires that fisheries planning be part of national development policies and strategies.

This becomes all the more evident when fishery planning strategies are made explicit, and involve such elements such as the following:

- rationalizing production with a view to maximizing utilization of the resource and means of production;

- enlarging the domestic market by means of programmes to reduce consumption prices and publicizing the product's food qualities;

- organizing and giving continuity to appropriate processes of supplying markets with fish;

- better utilization of installed fish processing capacity and rational utilization thereof;

- organizing social services among artisanal fishing communities;

- reviewing economic and financial instruments made available to the sector;

- studying new forms of credit, financing and subsidies for the sector;

- expanding the cold chain and utilization of what is available in a more rational manner, in a way to satisfy the needs of the fishery sector;

- reviewing all resettlement and industrial emplacements on the seashore, and particularly those next to estuarine ecosystems;

- revising all fishing concession agreements granted to fleets flying foreign flags;

- consolidating legislation for the protection of mangrove swamp vegetation and other coastal ecosystems;

- establishing environmental education programmes on formal and informal lines relating fishing to environmental conservation and the rational management of fishery resources;

- enlarging studies on hydrological cycles, mainly in relation to river basins;

- controlling planting activities on river banks;

- protecting lagoons along the large rivers;

- redimensioning of dams and in-depth treatment of areas to be flooded;

- studying the biology of fish suitable to repopulate eutrophic areas;

- protecting of seashore dunes and vegetation;

- enlarging programmes for the surveillance and control of fishing activities;

- revising legislation for the protection of species in danger of extinction.

In order to put the abovementioned strategy into operation, apart from strengthening relations between the government and the private sector of the economy, fisheries planning should also adopt an instrumental policy for the promotion of fishing, in the sectors of fish biology, technology, fishing economy, socio-anthropology, aquaculture, marine culture and basic legislation. An ample fisheries extension programme should also contemplate the following questions: drawing up more flexible economic and financial instruments; an appropriate credit policy; community development; making financing available to those operating in the sector; implementing a technical assistance programme; and setting up appropriate subsidies and incentives for fishing and other activities connected with it.

Bearing in mind that in developing countries the establishment of industrial complexes next to the seashore and the development of large farming/livestock projects, all aiming at exports, usually lead to veritable "enclave" economies, it is necessary to create a local entrepreneurial mentality aimed at creating economic activities to employ labour not absorbed by those large projects which use available natural resources and may take advantage of the incipient capital and investment resources guaranteed by small domestic savings.

In this case, one must emphasize the production of goods in the primary sector, including processing, handling, stocking and marketing. In this connection fisheries appear as an area of food production where the traditional industries play a crucial role.

Scientific and technological policies must be developed for the fisheries sector in accordance with a national development plan. Because of its specific nature, this policy is worth dealing with in this paper. These policies may be conceived through bi-dimensional models which use a whole range of technologies (Figure 1).

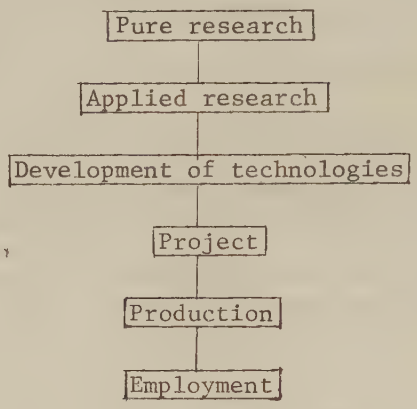
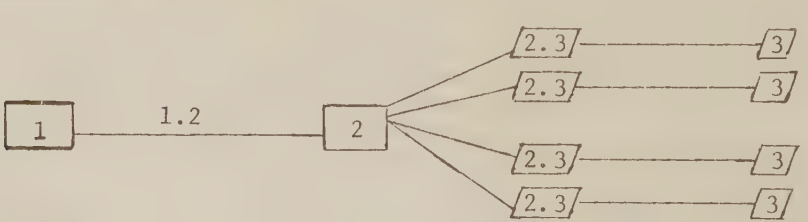


Figure 1 Flow 1: vertical dimension of technology's spectrum

In its vertical dimension this "spectrum" begins with the analysis phenomena related to the universe and the laws that govern it, a discovery which in most cases is the result of studies which embody the natural satisfaction of man's curiosity and the broadening of our understanding of the same universe. This is the phase of basic scientific research in which we will find several phases of fishery research, mainly in the area of the biology and autoecology of the species. This phase is followed by applied research in which the knowledge obtained in the previous phase is used in order to make their practical applications possible. In both phases results are gained which unfortunately, very often remain stored away in university libraries, adding to the piles of master and doctorate theses and dissertations. It is then necessary to improve the methods, processes and products obtained in the preceding phases at acceptable costs in order to satisfy societal needs. This phase is characteristic of the development of products and processes. We then go into the project phase in which the characteristics of the product or process must be defined with precision. The real transformation of what has been projected, normally in a pilot scale, then becomes a scale production.

The horizontal dimension of the technological spectrum begins at a generating centre (public or university institute); it is transferred to an information reception centre (training of technical cadres which received the know-how). It is diffused to professional readers through scientific or technical publications or extension programmes, being employed by the readers (public and/or private institutions) which utilize the results obtained (Figures 1 and 2).



Legend:

1. Generating Centre
1.2 Transfer
2 Centre receiving information
2.3 Dissemination
3. Units employing results

Figure 2 Flow 2: Horizontal dimension of technology's spectrum

Once both dimensions have been placed inside a matrix structure, with letters assigned to the cells, we shall be able to obtain different paths, making it easier for the planning body to choose groups of projects of interest to the sector and which, by order of priorities deserve financing, subsidies, incentives, etc. (Table 1).

Table 1

Flow matrix (decision tree)

Horizontal dimension / Vertical dimension	Generation	Transfer	Dissemination	Employment
Pure research	A	B	C	D
Applied research	E	F	F	H
Development	I	J	K	L
Project	M	N	O	P
Production				Q
Consumption				R

Leaving aside the concept of paths and reestablishing the matrix, we shall obtain the fields of operation of various policies (Table 2).

Table 2

Policy matrix

Horizontal dimension / Vertical dimension	Generation	Transfer	Dissemination	Employment
Pure research Applied research	Research Policy		Education Policy	
Development Project		Transfer Policy	Extension Policy	
Production Employment				

The research policy will comprise the creation of basic and applied research and, to a smaller extent, will generate development.

The technology transfer policy will deal with the diffusion of know-how in the form of development of technologies or projects without necessarily requiring expertise from abroad. The education policy will handle the dissemination of pure and applied research as well as that of development.

The extension policy (agricultural, industrial and fishing) will include the diffusion of development and of the project.

Thus, the technological policy, and in our particular case the fishing policy, may be defined by the sum of the technological components of research, transfer, education and extension policies, in addition to the paths that will make up the decision free for the assignment of priorities.

The lack of a clear exposition of a scientific and technological policy such as that described above has probably led many countries of the third world to a dispersal of scarce resources by overlapping research, the lack of absorption of results by the production sector; the training of technicians for the sector (fishing engineers, oceanographers, ecologists, etc.) far beyond the absorption capacity of this personnel by the fishing industry; maintaining a fragile and inefficient policy of transfer and dissemination of knowledge developed at university institutions and other official research bodies; and, finally, the inefficient application of fisheries policies often divorced from the other sectoral and global policies, among which the scientific and technological policies can be considered the main causes of failure of many fisheries development programmes.

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THE ROLE OF INLAND FISHERIES AND AQUACULTURE IN RURAL DEVELOPMENT

by

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ABSTRACT

This paper reviews the present situation of inland fisheries and aquaculture and looks at some specific problems such as: urban bias, lack of socio-political representation, resource limitation and technology transfer. The paper concludes by looking at the contributions of inland fisheries and aquaculture to rural development and suggests the principles for optimization.

INTRODUCTION

The topic of this presentation is made up of three keywords: (i) inland fisheries; (ii) aquaculture; and (iii) rural development. In a general way we can say that inland fisheries is the most ancient system of primary production which still exists on an important scale. In the developed world it is of marginal economic importance, whereas for large population groups of the developing world it constitutes a major source of food, income and employment.

Aquaculture, although practised traditionally in Asia for centuries, is still new as a modern system of primary production. In a few countries, both developed and developing, aquaculture contributes significantly to the local economy. In most countries it has, however, only just started to show results, on either experimental or pilot scale.

Inland fisheries and aquaculture, one ancient and the other an innovative system of aqua-food production, are set, with respect to location and to many common social, cultural, economic and environmental determinants, as part of the rural sector. Rural development has been the focus of the development debate for a number of years now, but has remained a problematic issue both in theory and practice. Without entering this complex issue as such, I will try to highlight where particular dimensions of rural development are relevant for inland fisheries and aquaculture, and where the aquatic systems of primary production can contribute on an increased scale to rural development. Before addressing these perspective aspects, I will provide some factual information concerning the magnitude of inland fisheries' and aquaculture's present contributions to development.

PRESENT SITUATION OF INLAND FISHERIES

Although there are some important exceptions such as the riverine and lake fisheries of the USSR, inland fisheries are economically much more important for the developing countries than for the developed countries.

As a matter of fact, inland sport fishing in countries like the USA or France yields more returns than commercial fishing in terms of social and economic benefits. The following Table 1 shows, for example, that the landings of inland fisheries contribute relatively little to overall landings in North America and Europe.

Table 1 also illustrates the relative importance of inland fisheries for the developing world, particularly for Africa (34%) and for Asia (15%). Looking beyond the statistics there are arguments which further underline the relevance of inland fisheries for many developing countries:

(i) the statistical catch data should be considered conservative since the geographical dispersion of many fisheries restrict statistical coverage, statistical data collection methods are weak, and part of the catches is home-consumed, bartered, etc.;

(ii) given the mixed market/subsistence economies of many isolated rural areas, occasional and part-time fishing (often carried out by women and children), provides the major part of animal protein consumed in many rural households;

(iii) inland fisheries are almost entirely carried out on a small scale and are extremely labour intensive, creating a large number of jobs. In spite of contributing only a little over 10% of the total landings, it is estimated that about 40% of all fishermen work in inland waters.

Table 1

Fish landings by regions/million tons rounded[a/]

Region	Inland	Marine	Total	% of IF
Africa	1 408	2 678	4 086	34
America, North	227	6 993	7 220	3
America, South	275	8 276	8 551	3
Asia and Oceania	4 853	26 991	31 884	15
Europe and USSR	1 181	20 807	21 998	5
Total	7 944	65 745	73 739	11

PRESENT SITUATION OF AQUACULTURE

As mentioned before, aquaculture, i.e., the raising of aquatic organisms under controlled conditions, is an age-old practice in some Asian countries and in Europe since the Middle Ages. Intermediate forms of culture/capture such as retaining fish in natural ponds or protecting shellfish banks exist all over the world. However, aquaculture, as a modern system of aqua-food production, is still a young and growing industry.

The last worldwide survey of aquaculture production produced the figures given in Table 2.

Compared to the earlier 1975 survey, total production increased by 42 percent. However, these increases occurred mainly in Asia, North America and Europe, regions where modern aquaculture reached its take-off phase some time ago. In Europe and the USA, aquaculture has developed to such a scale that it provides some of the cheaper animal protein products for human consumption and has provoked concern among environmentalists with regard to sometimes excessive amounts of waste discharged from production sites. Asian success stories include super intensive catfish culture and the adaptation of the Chinese model of fish culture integrated with crop raising and animal husbandry.

In other parts of Asia, South and Central America and, above all, in Africa (where aquaculture could become a major means to fight malnutrition and basic rural structural problems such as underemployment and low incomes), aquaculture has, nevertheless, remained of marginal importance. Some of the problems which at present keep aquaculture from playing a stronger role in rural development are outlined below.

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a/ Data from the 1981 FAO Yearbook of Fishery Statistics

Table 2

Aquaculture production by species-group and region, 1980[a/]
(metric tons)

Region	Finfish	Molluscs[b/]	Crusta-ceans	Seaweeds	Total	% of grand total
Africa	4 061	471	-	-	4 532	0.05
America, North	25 480	44 404	5 360	-	75 244	0.86
America, South	57 386	76 993	5 596	-	139 975	1.61
Asia and Oceania	2 516 203	2 568 925	60 260	2 206 434	7 351 822	84.43
Europe and USSR	630 196	505 516	30	50	1 135 792	13.05
Total	3 233 326	3 196 309	71 246	2 206 484	8 707 365	100.00

Some Specific Problems of Inland Fisheries and Aquaculture

The Urban Bias

A large part of inland fisheries and aquaculture production is carried out on an occasional or part-time basis, with a partly subsistence, partly market orientation. As systems of rural primary production, they provide mostly for household, local or domestic consumption, which as non-export or urban destined food production makes them less favoured in terms of public investment in infrastructure, social services and development support in general. The urban bias also accounts for the relative priority given to hydro-energy generation, irrigation and the like in multipurpose water inpoundment schemes. Pollution, caused by industrial development, mining and intensive agriculture, has also caused dramatic catch decreases and has significantly damaged fish culture.

Lack of Socio-Political Representation

Most inland artisanal fisheries and small-scale aquaculture are largely atomistic in nature, both in their organization and geographic distribution. They are statistically poorly documented and their economic role is little understood by the urban public. They provide little opportunity for central Government to collect direct taxes, while the generally low income levels and the resulting low purchasing power of the inland fisherfolk provide marginal opportunities even for indirect taxation. Both factors result in a low socio-political profile for small-scale aquafood production.

Even for some of the larger scale operations, both capture and culture, there are usually no established mechanisms through which they can express their respective interests to the central Government or to increase the awareness of the public with regard to their role in development.

Being socio-politically underrepresented, inland fisheries and rural aquaculture are often left out of sectoral development plans and, whenever integrated rural development is approached, their potential role is little recognized.

Resource Limitation

Although many inland waters are already exploited to an extent where increased fishing effort would hardly be economical (a few are overexploited), inland fisheries and, in a different way, aquaculture, can be considered resources with large potentials for increase.

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a/ Data compiled by the FAO/UNDP Aquaculture Development and Coordination Programme (ADCP), FAO, Rome

b/ Weight includes shells

There are, nevertheless, limitations. For capture fisheries, resource limitations may stem from climatic changes which have a greater influence on inland waters than on marine waters. Also, inaccessibility and long distances to market restrict catch increases in the case of many inland waters.

Constraints to aquaculture development are different from case to case. In general two types of operations - the African model and the Asian model - can be distinguished. The African model would have relatively free access to land and water, but trained human resources and incentives for producers would be a limiting factor. The Asian model would have an abundance of human resources but extremely limited access to land, water and other natural resources. Both models, and the spectrum of their variations, have common problems with inputs such as feed, fingerlings and equipment. On an overall basis, aquaculture, in real terms, is frequently in competition for inputs with other types of primary production. This may apply to a lesser extent to inland fisheries as far as production inputs are concerned. For access to, and a share in the market, competition is a reality for both production systems.

Technology Transfer

Many of the problems of both inland fisheries and aquaculture are problems of technology transfer. With respect to inland fisheries, these problems have been similar to those experienced in coastal small-scale fisheries, i.e., the technology is often not appropriate with respect to the socio-economic and natural environment, causing socially disruptive or biologically hazardous development patterns and dependence on external inputs and externally controlled marketing.

For aquaculture development, technology transfer has been and is the central and crutial determinant, although not, as sometimes assumed, the only one. In most African and Latin American countries, aquaculture was a new innovative concept of primary production. The planning and implementation of its introduction has often suffered from the lack of adequate care in considering the non-technical and non-biological aspects. In many of these cases it has been shown that aquaculture could produce food, income and employment. In reality, however, away from institutes and privileged pilot projects, the concept has remained exotic to the local production structures of many countries.

SOME PRINCIPAL ISSUES WITH RESPECT TO FURTHER DEVELOPMENTS

There are few places where either aquaculture or inland fisheries are developed to the extent where the optimum of socio-economic benefits (in whatever way this rather rubbery term is defined in the respective socio-political reality) are reached or approximated. In most areas, and certainly in the developing world, the use of existing resources can be improved.

Specific Contributions to Rural Development

If the strategies which aim at developing the resources are appropriate to the actual environment, inland fisheries and aquaculture can contribute in very specific ways to rural development such as:

Providing protein: Provision of protein rich foods to low income, marginal or isolated population groups. Occasional and part-time subsistence fishing are often crucial to rural families, especially those whose income level does not allow them to purchase protein foods on the market. Also, and in contrast with a large part of industrialized marine fish capture, artisanal inland fishing and rural aquaculture produce (with some notable exceptions) for local human consumption;

Creating income: Income creation, in cash or kind where surplus production is marketed. Most catches from inland fisheries, as well as the larger part of aquaculture harvests, are marketed;

Providing security: Where aquaculture is introduced successfully it can improve the material security of small farming families by diversifying their production structure;

Accumulation of capital: By using mostly local inputs (family labour and local materials, wastes, etc.) both aquaculture and inland capture fisheries can contribute to rural small-scale capital accumulation. At the same time, both production concepts provide small unit investment opportunities.

Vertical integration of production: Aquaculture can be vertically integrated. Due to a clear correlation between inputs and output, vertical integration with marketing and processing operations is feasible for most aquaculture ventures because planned production can assure timely supplies. To a lesser extent this applies also to inland fisheries where water bodies are restocked.

Horizontal integration with other rural production: Aquaculture and inland fisheries can be horizontally integrated with other rural production. Many water bodies are used multipurposely, e.g., for fishing, irrigation and animal husbandry;

Principles for optimization: In order to optimize the role, the two systems of aquafood production can play in rural development programmes, the same principles which are valid for other rural primary production have to be followed. These include:

- multidisciplinary "from below" planning of development efforts;
- participation of the target group during planning as well as during implementation;
- design of technologies and management systems which are appropriate to the needs and means of the people involved and which will bring about equitable growth and increased self-reliance;
- development support which continues as long as it is needed and does not create new dependencies. Here aquaculture as an innovation will need particular efforts, i.e., extension work, etc.; and
- inclusion of inland fisheries and aquaculture in integrated rural development plans.

FUTURE PERSPECTIVES FOR TECHNICAL ASSISTANCE IN FISHERIES DEVELOPMENT WITH REFERENCE TO TCDC

by

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ABSTRACT

This paper describes the disenchantment of the developing countries with the way technical assistance was taking place and how the idea of technical cooperation between developing countries (TCDC) emerged. The general principles of TCDC are outlined, along with some suggestions on their application to fisheries development and the difficulties anticipated.

INTRODUCTION

TCDC was born out of a simmering unease among developing countries regarding the transfer of technology projects and activities to which they were recipient. Over time, it had become apparent that the importation of the developed countries' technology did not create the development it purported to bring about. This was usually because:

(1) the models being imported had no validity for the developing countries, being based on values totally alien to their respective realities;

(2) the technology being applied by foreign experts was premised on methods directed toward solving rich country problems and based on rich country resource endowments (and often disregarding useful, existing and indigenous technology);

(3) the technology transfer was perpetrating the recipient country's state of dependency (e.g., export earnings cannot meet payments on technology hardware and borrowings).

At a founding meeting of the Third World Forum in Karachi in 1975, one of the participants rendered this assessment of the situation: "Since the days of Vasco de Gama, the method and meaning of world development has been defined by the rich nations."

In the experience of the disenchanted developing countries, the transfer of technology involved simply physical transfer of technological hardware, often in disregard of existing indigenous technology (dismissed by foreign experts as "crude") and neglecting to include the transfer of the software know-how to the locals (thus, perpetrating technological dependence). In which case, the real beneficiary of the technology transfer was not the developing country but the donor country which supplied the technology.

In time, many developing countries discovered for themselves that there could be no meaningful development unless mass poverty and the satisfaction of minimum human needs were directly confronted through their own indigenous efforts and through their own value systems.

Through such painful experiences, there came about the questioning of the models, the designs, and the imported "packages" of technology offered through the various channels of so-called "development assistance".

In the seventies, a host of development issues pricked the awareness of many development practioners from developing countries when considering development problems. Their concerns can be summarized as follows:

- the models of growth being prescribed for entire developing economies as "the" way to development are, in reality, lacking in validation by experience. The risks involved in their adoption, therefore, can be staggering considering the absence of fall back resources with which the developing countries can absorb and/or salvage their errors;

- the importation of development "packages" often assume the simultaneous availability of a whole array of resources and infrastructures (with which the package operated successfully in its country of origin but which is absent, lacking or simply could not be afforded by the recipient country. These development packages become virtual "traps" for the recipient country, i.e., they find themselves further dependent - and excessively so - on foreign expertise and their precious foreign exchange committed toward keeping the expensive expertise and technology flowing;

- many developing countries linked their domestic development to the development of their export trade. However, studies have revealed that between 1954 and 1962, the prices paid in northern markets for commodities (agricultural and mineral) which many developing countries had set about expanding for export and foreign exchange earning purposes, actually declined on average by 25 percent. In the following ten years, such increases in prices as did occur were overwhelmed by much higher rises in the prices of the northern manufactured goods which third world countries had to import for development. When the overall trade balance returns were assembled for a whole 17 years of the less than 30-year period of independent development cooperation, it appeared that by 1972 the developing countries had experienced a net loss in their terms of trade amounting to US$ 10 billion more than all their receipts in official development assistance[1/];

- in 1981, while industrialized countries reduced their imports of non-fuel commodities from developing countries by US$ 2.6 billion, developing countries increased their imports from industrialized countries by US$ 5.5 billion. Henry A. Kissinger, in his article "Saving the World Economy"[2/], mentioned that "Developing countries, after all, absorb more than one-third of US exports (and more than 40 percent of the exports of the industrial democracies). For the United States this is more than what we export to the European Community and Japan combined."

- despite all efforts in development assistance, the social and economic benefits have not taken effect; in many instances it has even worsened the situation for many third world countries.

These circumstances germinated into the idea that a more meaningful approach was to look from within and, when necessary, to other developing countries for solutions to meeting common problems.

There now exists among the developing countries a growing awareness of selective development. As envisioned in the TCDC Plan of Action, selection is the process of enhancing third world creative capacity to find solutions to their development problems in keeping with their own aspirations, values and special needs and the creation of a new knowledge in tackling problems of development.

TCDC PRINCIPLES

TCDC stems from the New International Economic Order (NIEO) principle that technology is mankind's common wealth. Following the logic of the principle, technology should, therefore, not be peddled as a commodity. The flow of technology should not be uni-directional (i.e., transfer) as from the developed countries to undeveloped ones, from a superior tech-

1/ Childers, 1979
2/ Newsweek, January 24, 1983

nology to an inferior one. Neither should development be defined according to the concept prevailing in affluent countries nor should it be denied a country for its incapacity to pay royalty to the "owner".

UNDP defines TCDC as the sharing of capacities and skills between two or more developing countries. TCDC refers to development programmes, projects and activities in which major substantive inputs such as know-how and expertise, consultancy services, training facilities, equipment, supplies, etc., are provided by developing countries to one another. Cooperation may be bilateral or multilateral, public or private, covering all sectors and all kinds of technical cooperation activities, regardless of source and type of financing.

The principles and objectives of TCDC drawn up by the "Working Group" prior to the Buenos Aires Conference prescribe the TCDC concept to be broad and flexible, and to increasingly rely on innovative approaches, methods and techniques better adapted to local needs and at the same time utilize existing forms of technology and techniques to the extent to which they are useful. Moreover, the technical cooperation should be viewed as a venture in self-help whereby all participating countries should contribute as well as benefit from the cooperation and where the traditional distinction between donor and recipient is out of place.

FAO's RESPONSE TO TCDC

In connection with the TCDC Plan of Action, FAO issued a general directive that the TCDC concept be promoted at both country and regional levels of FAO programmes (adapted during the 20th Conference, Rome, 10-29/11/79).

TCDC IN FISHERIES

Developing coastal States' fisheries have been developed in a manner relative to national systems (technical, geographic, economic, political and social); hence, competence in the development and management of fisheries vary by country as well as by region. The opportunities for TCDC are many and varied. Within Asia and the Pacific Region, for example, there is substantial technical competence among the countries in the areas of aquaculture, tuna fishing, small-scale fisheries, village institutions, marketing and processing. Fish culture in cages and the production of fish fry are being successfully practised in Thailand and Singapore. The catching of tuna through the use of fish-attracting devices, as practised in the Philippines, allows small-scale fishermen to engage in commercial tuna fishing.

In Japan and Sri Lanka, coastal fishermen have demonstrated the effectiveness of sea tenure systems as a fishery management tool. In Indonesia, China and the Philippines, pond culture and mariculture have been in practice for many centuries. Burma, Bangladesh and Kampuchea have indigenous systems which effectively manage inland fisheries.

With the advent of the Extended Economic Zones (EEZ), the value of TCDC to resources management, fisheries development planning and implementation cannot be overlooked, specifically with regard to jurisdictional issues, cooperation and sharing of marine resources, responsibilities, institutional mechanisms, etc.

In many cases, developing coastal countries are finding it convenient to form regional coalitions to further their common interests. This perception has enabled such regional groupings such as ASEAN and the South Pacific Forum to function as policy planning and management, clearing houses and coordinating centers for development matters. New attitudes among developing coastal States toward marine resources, specifically fisheries, provide a whole range of possibilities in inter and intra-regional technological cooperation. They provide the basis upon which careful and selective fisheries development planning at national level (coordinated at a regional level) can be seriously undertaken.

EXPECTED DIFFICULTIES

Working with another developing country will be a novel experience for most developing countries. In Asia, for example, countries have been suffering from "contact-deprivation" (as a result of the Colonial Era) despite their proximity to one another. An amount of

distrust and wariness can be expected to surface in the course of the projects. Moreover, as a result of experiences with developed countries (the latter as former colonizer, technology transfer donors, or places where their techno-political leaders received schooling) there might be a feeling in some developing countries that their experts are only second best.

Attitudes cannot change overnight. On the other hand, the choice of experts, in keeping with the TCDC spirit, should consider not only educational backgrounds but actual experience in, and orientation toward, developing countries.

Moreover, the TCDC principle of utilizing indigenous technology will pose an initial problem in terms of identifying both technology and the experts. These may mean drawing up a directory of experts which include traditional, probably artisanal experts. Then, of course, specific problems are encountered in the transplanting of their indigenous technology and experts to other environments.

The financial realities of many developing countries might preclude their capability to pay for the experts or might render their remuneration scheme unattractive. There might also be a paucity of experts available for consulting work - said experts may be deeply involved in their own country's projects so that their government will hesitate to release them, or their consultancy would jeopardize their tenure.

If TCDC is to contribute to the overall aims of fisheries development for developing countries, appropriate institutional arrangements have to be created and supported through adequate funding.

INTERNATIONAL TRADE IN FISH AND FISHERY PRODUCTS

by

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ABSTRACT

The paper presents a brief analysis of the structure of international trade in fish and fishery products. Needs and possibilities for action to improve the participation of developing countries in international trade are identified.

INTRODUCTION

As a consequence of establishing the new regime of the ocean and the introduction of the 200-mi EEZ, some countries have lost fishing grounds and direct access to supplies while others have gained jurisdiction over resources. Developing countries are in both groups but, generally speaking, developing countries are considered beneficiaries of the new regime, although countries like Cuba, Thailand and the Republic of Korea lost traditional fishing grounds. The shift in resource and supplies availability requires adjustments through trade in order to match demand in the countries which previously had direct access to resources. If a country which gained resources is not in a position to exploit them, then countries which lost such fishing grounds may claim that the ownership implies an obligation to allow access to them. Another important consequence of the new regime is that in view of the expanded resource availability, Canada and USA made a great effort to develop their own national fisheries and a significant share of this output is destined to export where these countries compete with developing countries.

In addition to the changes in the framework of international trade which are direct consequences of the new ocean regime, there are other obstacles which prevent developing countries from reaping full benefits from international exchange of fishery products. Apart from tariff and non-tariff barriers in general, the reduction or removal of which would result in considerable trade expansion, there are specific factors which make participation and performance of developing countries in this area lower than they could be. These factors include exportation of raw material rather than finished products; low share in trade-related services such as transport and insurance, and in inputs, such as equipment, packaging material; inability to sufficiently discriminate for quality resulting in lower prices, detentions or rejections.

A number of issues and problems in international trade may be successfully tackled by action at national level (e.g., quality assurance, negotiation of market access), there are distinct opportunities for international cooperation which reflect the generally more international nature of fisheries as compared with most other food production subsystems. The various commissions organized by FAO for almost all marine and inland water areas of the world have effectively demonstrated their value for international cooperation in pre-harvest activities. An international approach for handling post-harvest matters has yet to be defined, but it would appear that significant contributions could be expected from it, particularly in international trade. Specifically, such an approach could enhance the collective self-reliance of developing countries by promoting intra-regional and South/South trade, as well as food security by reaching mutual agreements on access to markets and supplies, and by the continuous exchange of information which will have a stabilizing effect on markets.

STRUCTURE OF INTERNATIONAL TRADE IN FISH

Developments 1960-80

Exports of fishery products increased from 4.0 million tons in 1960 to 10.0 million tons in 1980 or, in value terms, from US$ 1 195 million to US$ 14 981 million. Import values went from US$ 1 300 million to US$ 15 284 and total world catch rose from 38 to 72 million tons during the same period

Table 1

International trade and principal countries
1960-80

	1960	1970	1980
Number of countries covered	127	151	158
Catch (million tons live weight)	32.6	61.5	69.3
Trade (million tons live weight)	10.1	23.1	24.2
Trade as % of catch	31.0	37.5	35.0
Exports (million tons product weight)	4.0	7.3	10.0
Exports (US$ 1 000 million)	1.2	2.9	14.9

Source: FAO Yearbook of Fishery Statistics, Vols. 13, 35, 51

The percentage of catch going into international trade can be interpreted as an indicator of the integration of the world fishery economy. It reached its peak with 42 percent in 1972, followed by a dramatic drop to 31 percent in 1973 (the same level as 1960), and it slowly built up again to 35 percent in 1980. The main reasons for this were developments in the South American fish meal industry which is the international market commodity, "par excellence".

Value figures on international trade in fishery products as recorded by FAO show, for the period 1976-81, an increase of the developing countries' participation from 11.5% to 13.6%, whereas their share in exports decreased slightly from 44.7% to 43.6%. This is mainly due to the rapid expansion of Canadian and US exports. In absolute figures, imports of developing countries increased by US$ 1 009 million to US$ 2 171 million and exports by US$ 2 718 million to the level of US$ 7 290 million.

It follows from the previous paragraph that the principal markets are in the developed world. In 1981, only four developing countries imported products worth more than US$ 100 million (against 17 developed countries in this category). In contrast, countries which in 1981 imported fishery products for less than US$ 1 million are, with two exceptions, all in the developing world. There are 17 countries which hold a market share of 1% or more of global imports and over 100 which are taking less than 0.1%. The 10 largest importers receive about three quarters of products imported (in value terms) and the 30 leading import markets attract over 90% of world fish imports and the share of developing countries in this group amounts to 8.2%. (Additional details are given in Appendix 1).

Unlike imports, exports are wider spread. About half of the countries exporting more than US$ 100 million are developing countries (17 of 36); in 1976 there were only 10 (out of 25) developing countries in this category. However, the group of countries which, in 1981, exported less than US$ 1 million worth of products consist, with one exception, of developing countries. This situation is also reflected in the export market share where 25 countries hold a share of 1% or more, but 97 less than 0.1%. The 10 leading exporting countries account for one half of the global export value and the leading 30 nations for

Table 2

Structure of international trade in fishery products, 1976 and 1981, 159 countries/territories

	Imports			Exports		
	1976	1981	Change 1976/81	1976	1981	Change 1976/81
World total (US$ million)	10 099	15 959	+ 58.0%	10 221	16 734	+ 63.7%
- thereof developing countries (US$ million)	1 162	2 171	+ 86.8%	4 572	7 290	+ 59.4%
No. of countries category US$ 100 million or more	16	21	+ 5	25	36	+ 11
- thereof developing countries	2	4	+ 2	10	17	+ 7
No. of countries category US$ 1 million - below US$ 100 million	77	88	+ 11	78	65	- 13
- thereof developing countries	61	73	+ 12	60	50	- 10
No. of countries category below US$ 1 million	66	50	- 16	56	58	+ 2
- thereof developing countries	54	48	- 6	55	57	+ 2
No. of countries with shares of						
- 1% or higher	16	17	+ 1	25	25	0
- 0.1% to under 1%	37	40	+ 3	40	37	- 3
- less than 0.1%	106	102	- 4	94	97	+ 3
Share of countries ranked (%)						
- first 10	75.1	73.7	- 1.4	50.5	49.9	- 0.6
- first 20	86.1	86.1	0.0	68.6	68.4	- 0.2
- first 30	90.1	90.8	+ 0.7	78.3	77.4	- 0.9
No. of developing countries within ranks 1-30	7	8	+ 1	15	15	0
- total share of these (%)	5.8	7.2	+ 1.4	25.8	27.5	+ 1.7

Source: FAO Data Base

about three quarters. The share of developing countries in this group reached 35.4%, almost 2% higher than the 1976 level (33.5%), raising their participation in total developing countries' exports from 58.2% to 64.5%. This indicates that the leading exporters in the developing world have been able to strengthen their position. (See Appendix 1).

Principal Commodities

Frozen and canned

The principal product flows for frozen groundfish are within North America, within Western Europe and across the Atlantic. The leading import market is the USA. Important suppliers are Argentina, Chile, Republic of Korea, Peru and Uruguay from the developing world. During the last decade, a number of developing countries in Asia, Africa and Latin America achieved considerable growth in tuna exports, but they were very badly affected by shrinking demand in the leading market, the USA, due to high prices. Whereas production and trade of canned salmon and herring is almost exclusively related to developed nations, the canned mackerel, for which Japan is the main producer, is largely destined to developing countries. However, there are several developing countries which produce and export canned mackerel, albeit on a much lower scale than Japan. Canned sardine and pilchard products are commodities where developing countries play an important role both as exporters and importers and where South/South trade is already significant.

Shrimp and Cephalopods

Around 70% of the world's shrimp exports originate in developing countries and more than half of the world's catch is consumed in USA, Japan and Western Europe. Shrimp production increased by 60% between 1970 and 1980 (to 1.7 million tons live weight equivalent) and appears to have reached its peak for the fishing areas now under exploitation. Shrimp culture operations now make an increasing contribution to shrimp supplies but they still represent less than 5% of world landings. The principal market for cephalopods is Japan and the supplies from developing countries are rapidly increasing with six main suppliers in 1978; 14 in 1979; and 29 in 1980.

Fish meal and Fish oil

About one half of world fish meal exports originate in developing countries, with Chile, Peru and Thailand as the major suppliers and the other half in developed nations with Denmark, Norway and Iceland as the main exporters. Approximately 40% of world fish meal production goes into international trade (over 60% in the case of developing countries' production). Total world exports of fish meal reached a peak of 3.5 million tons in 1968, and declined to 3 million tons around 1970 and fell to 1.5 million tons in 1973. Since then the level has fluctuated between 1.9 and 2.3 million tons per year. Fish oil production and trade is connected to fish meal, but an appreciably higher share of production (about two thirds) enters international trade; major exporters are, however, the developed countries, such as Japan, USSR, Norway, Denmark and Iceland.

Prospects for the Future

In view of the uneven distribution, globally, of fishery resources and human population, it must be expected that international trade of fishery products will continue to be an important feature of national fishery economies. Furthermore, the very wide spectrum of products and related prices will necessitate directing these products toward effective market demand and purchasing power which in many cases will imply the crossing of national boundaries. It is, therefore, in the interest of the poorer nations in need of supplies to acquire them at adequate quality and at the lowest possible price. Equally important is the consideration that countries which export products which have limited demand on the domestic market, due to low purchasing power, should obtain adequate revenues which allow surpluses to be used for the development of other sectors.

Marketing costs should be kept as low as possible and measures inhibiting trade withdrawn. Quality levels and other product characteristics should be achieved which make it possible to realize the best prices over the medium term. Trade requires a climate of general confidence and security of operation for a longer period, i.e., stability over a

medium term period. Short-term maximization of prices and erratic changes in markets have a disruptive effect and should be avoided. In order to make the role of international trade for fishery development in the future fully effective, it will be necessary to achieve coordination and cooperation in trading, as such, and to ensure that the right products are produced for the right markets. All such actions should duly consider the needs of the domestic market to make a cohesive development possible, since the development of an industry based exclusively on export markets holds a high risk of failure. On the other hand, the secondary benefits from successful export production and trade can be significant for that part of the industry which is primarily concerned with the domestic market. Such effects range from an efficient production system, good industrial infrastructures, trained personnel to improved production concepts and marketing techniques.

BARRIERS TO TRADE

This paper does not intend to provide an exhaustive review of barriers to international trade in fish and fishery products, nor will it be necessary to convince anybody of the importance of the subject. The Register of Import Regulations for Fish and Fishery Products prepared and published by FAO with financial assistance from Norway, contains all information on tariffs and other regulations for over 100 countries which the exporters should know. OECD is preparing a special study on trade barriers. The EEC acknowledged the importance of exports of fishery products for some of the ACP countries by including them in the list of commodities covered by the STABEX system (shrimp and squid) and by waiving the rule of origin in the case of canned tuna exported by Fiji.

Another recent development should be noted. With the introduction of the EEZ some European countries lost access to grounds traditionally fished by their fleets and in subsequent negotiations on granting access to the item of market access was introduced, i.e., market access for fishing rights. In addition, steps were initiated to give fishery commodities a status closer to industrial products which are usually handled with less restrictions and trade barriers than agricultural commodities. These efforts eventually prompted GATT to undertake a specific study on fishery commodities which is due to be discussed at a ministerial meeting in 1984.

International negotiations on tariffs and non-tariff barriers, as such, do not belong to FAO's area of work but events will be monitered and it is expected that collaboration with the organizations responsible will be intensified in future so that these organizations can make full use of FAO's competence with regard to product and production related aspects, and that FAO can adequately fulfil its role as an information echange agency.

A DESIRABLE SCENARIO FOR FUTURE INTERNATIONAL TRADE IN FISH AND FISHERY PRODUCTS

The need for an international trade based on fair terms and effected between patners of reasonably equal strength is probably accepted everywhere. Differences of opinion are likely to arise about what should be fair, and when and where differences in bargaining power lead to unfair arrangements. But with the full participation of all concerned, it should be possible, through an international mechanism of consultation, in the spirit of cooperation, to develop understandable criteria of fair trade and, particularly, to provide the weaker segments of the international trading community with sufficient assistance so that they can gain experience and confidence. This may reduce the opportunities of the strongest to exploit a situation entirely to their own advantage - (it is not sure that such cases are really part of day-to-day business) - but it would make a significant contribution to the stability and foreseeability of trade and, as such, help to firm up the bases for development. This would then be greatly to the advantage and benefit of both producers and consumers.

Scope for TCDC and ECDC

Technical and economic cooperation between developing countries is recognized as an extremely important means of enhancing collective selfreliance of the developing world, and international trade in fish and fishery products could serve as a very instructive example in this respect. Already there is the example of cooperation in assessing and exploiting marine fisheries resources in the Northern Hemisphere. Upon FAO's initiative, regional committees and commissions have been set up which by now virtually cover all

marine areas and inland water areas. The cooperation covers resource evaluation and monitoring and, in some cases, it includes joint management schemes and conditions of exploitation. However, the structure of these commissions is not appropriate to the efficient handling of such food security aspects as access to markets and supplies because these require an interregional approach. Cooperation in fish processing and marketing could tackle a rather wide range of topics, including exchange of technical and marketing information; standardization of products; quality inspection methods; product promotion; coordination of shipping; joint ventures; joint insurance schemes against rejection of products; and joint participation in trade fairs.

The successful performances of the trade contact and promotion offices, maintained by leading developed country fish export organizations in major markets, shows the advantage which developing countries could gain from similiar establishments. It would be useful to explore the possibilities of establishing such offices for developing countries in Japan, the USA and Western Europe, and the assistance which the market countries might be able, and willing, to provide for this purpose. An evaluation of India's experience in this area would be useful.

While collaboration between Governments is necessary, the possibility for positive action in fish trade development lies chiefly with the industry and, therefore, direct involvement of the industry itself and its associations is required, both in producing and market countries. The purpose of cooperation in fish trade between developing countries cannot be a confrontation with the customers in the industrialized world, but it should rather lead to mutual recognition and respect, including an understanding of the particular conditions of fisheries in tropical developing countries.

A multinational mechanism for consultation on international fish trade matters could be based on the network of regional marketing information services which FAO is developing. Shortened to acronyms they are the operational services INFOPESCA (for Latin America) and INFOFISH (for Asia/Pacific) and the planned organizations INFOPECHE (for Africa) and INFOSAMAK (for Arab countries). In addition, a coordination mechanism, which FAO is about to implement under its Regular Programme, would provide for coordination between the regional systems and with OECD and COMECON countries.

Potential for Intraregional Trade

Trade stems from, and assists in, the diversification of economic activities, and diversification in itself makes an economy stronger inasmuch as negative developments in one sector may be offset by recovery in others. With the aim of collective self-reliance, developing countries will have to expand exchange between themselves, including trade. Today, fish trade between developing countries is rather limited if we disregard the exceptions, such as Hong Kong and Singapore. It is also understandable that trade toward the richer markets is easier to develop than say, between Latin America and Africa. However, the scope for an intensified South/South trade in fishery products may be substantial, not only in the interregional, but also the intraregional sense. The scope has to be kept wide open because it should not be restricted to exchange of fishery products between countries, but in a number of cases, countries may be able to export other products to markets from where they receive fish. A detailed investigation may be worthwhile to identify market niches for specific products in developing countries which could be supplied by other developing countries. International food aid programmes could play catalytic role in the identification of such possibilities and in promoting production and market development.

Production and Export of Finished Products

Apart from a general expansion of present trade and the assurance of adequate quality levels, a considerable potential appears to exist in the production of finished or intermediate products rather than in exporting raw material. As far as labour costs are concerned, developing countries should have a definite advantage here. However, it would also require imports of equipment and materials, such as tin plate for canning, which may not be economically feasible in some countries due to heavy taxation of such operations. Furthermore, a serious investigation of the mechanics of the particular target market will be needed to determine under which conditions the export of finished goods is feasible. A pertinent

point here is that servicing a consumer market from far away, and outside the country, will hardly be possible because this market segment demands quick adjustment to short term changes. The example of the fish stick market is probably not valide for products such as canned tuna where developing countries have gained a significant share, e.g., imports in 1982 accounted for over 20% of US consumption; in 1977 they were 5%. The investigation of the possibilities for exporting finished products should not be limited to established product concepts. New concepts may be viable also.

Inputs and Trade-Related Services

If equipment and essential inputs, e.g., tin plate and other packaging material, have to be imported for the production of export products, the total value accruing to the developing exporting country will be reduced accordingly. The fishing sector has probably little chance of directly remedying such a situation. However, there is much more chance of achieving a rationalization of marketing costs by the pooling of shipments; the operation of transhipment points; joint insurances, etc. Eventually the developing nations may aim at having shipping undertaken by transport vessels under their own flags.

Common Fund of Commodities

The Common Fund for Commodities was established by UNCTAD under its Integrated Programme for Commodities in 1980. To date, it is still not in full operation and fishery commodities have so far not been considered in connection with funds which might become available under the Second Account of the Fund. The increasing awareness of fishery commodities in organizations such as OECD and GATT may eventually also induce the parties of the Common Fund of Commodities to include them in the list of commodities eligible to receive funding for commodity and market development measures, aimed at improving the structural conditions in markets and at enhancing the long-term competitiveness and prospects of particular commodities. Since it is not likely that there will ever be an International Commodity Agreement established for fish, a substitute body would be required according to the statutes of the Common Fund. FAO could make arrangements for such a body, which could be in the form of an International Commission for Fishery Products working along the lines of the inter-governmental groups established by FAO for other agricultural commodities with, however, due regard to the requirements stipulated in Schedule C of the Common Fund Agreement. At the same time, such a commission/group/body would be able to take care of the multinational consultations proposed at the end of paragraph: "Scope for TCDC and ECDC" (on page 267).

APPENDIX 1

Imports and Exports of Fishery Products by 30 Biggest Importing and/or Exporting Countries, 1976 and 1981

	Imports 1976	Imports 1981	Change 1976/81 (%)	Exports 1976	Exports 1981	Change 1976/81 (%)	Exports minus Imports 1976	Exports minus Imports 1981
Leading importers and exporters:								
Japan	2 296	3 737	63	631	863	37	- 1 665	- 2 874
USA	2 086	2 988	43	508	1 142	125	- 1 578	- 1 846
France	655	1 051	60	151	304	101	- 504	- 747
UK	556	997	79	197	318	61	- 359	- 679
Fed. Rep. of Germany	667	819	23	226	281	24	- 441	- 538
Spain	156	479	207	236	436	85	80	- 43
Hong Kong	215	362	68	132	179	36	- 83	- 183
Netherlands	258	330	28	315	512	63	57	182
Denmark	175	305	74	629	940	49	454	635
Canada	206	299	45	762	1 267	66	556	968
Australia	129	162	26	160	268	63	31	106
China/Taiwan	67	139	107	253	623	146	186	484
USSR	45	76	69	195	243	25	150	167
Brazil	54	68	26	74	154	108	20	86
Sub-Total	7 565	11 812	56	4 469	7 530	68	- 3 096	- 4 282
Other leading importers:								
Italy	425	720	69	55	107			
Belgium	256	348	36	48	73			
Sweden	218	270	24	52	95			
Nigeria	114	240	111	0	4			
Switzerland	139	206	48	5	3			
Singapore	89	162	82	61	135			
Portugal	88	152	73	70	89			
South Africa	18	117	550	108	101			
Finland	55	101	84	2	8			
CSSR	73	98	34	3	3			
Yugoslavia	55	85	55	18	34			
Greece	31	83	168	12	18			
Cuba	39	81	108	65	124			
Austria	65	79	22	1	2			
Saudi Arabia	24	79	229	1	3			
Malaysia	44	71	61	83	125			
Sub-Total	1 733	2 892	67	584	924			

APPENDIX 1 (cont'd)

US$ million

	Imports 1976	Imports 1981	Change 1976/81 (%)	Exports 1976	Exports 1981	Change 1976/81 (%)	Experts minus Imports 1976	Experts minus Imports 1981
Other leading exporters:								
Norway	28	59		805	1 002	24		
Korea, Republic of	17	58		697	835	20		
Iceland	0	1		381	713	87		
Mexico	12	34		197	538	173		
Thailand	7	23		177	358	102		
Chile	2	2		124	337	172		
China	0	0		161	325	102		
India	0	0		197	269	37		
Philippines	28	39		42	204	386		
Indonesia	10	38		153	203	33		
Morocco	0	0		71	190	168		
Peru	0	0		226	178	21		
Ecuador	0	0		73	166	127		
New Zealand	10	21		49	165	237		
Argentina	7	24		86	143	66		
Greenland	1	1		48	143	198		
Sub-total	122	300		3 487	5 769	65		
Total 30 leading countries	9 298	14 704	58	7 956	13 299	67		
- thereof developing countries	646	1 202	86	2 663	4 702	77		
- % share of these	6.9	8.2		33.5	35.4			

Source: FAO Data Base

PECHES ET STRATEGIES DE DEVELOPPEMENT
DISCOURS ET PRATIQUES

par

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RESUME

Les discours sur le développement des pêches dans les pays en développement sont déterminés par l'assimilation abusive entre richesse nationale et exportations; par la croyance en une efficacité supérieure des formes industrielles de pêche, par une réduction hâtive de la pêche artisanale à ses seuls effets sociaux. Dans le cas sénégalais, la pêche artisanale démontre qu'il est possible de concilier rentabilité élevée du capital, faiblesse de l'investissement, forte utilisation de main-d'oeuvre et taux élevé de valeur ajoutée. Substituer l'analyse des faits à la doctrine du "il n'y a qu'à" issue des discours dominants suppose un développement intensif des recherches de base, sur longue période; or, la nature des recherches entreprises comme le développement des pêches est déterminée par la division internationale du travail. Cette même division internationale tend à placer les pêcheries artisanales dans une situation accrue de dépendance et de fournisseurs à bas prix à l'égard des pays riches: cette tendance risque de s'accentuer avec la création des ZEE.

INTRODUCTION

L'intérêt pour les aspects non biologiques des activités de pêche est récent et doit être porté au crédit des biologistes des pêches eux-mêmes. Ce caractère récent explique peut-être que les aspects économiques et sociaux des pêches soient encore appréhendés à travers une série de mythes relatifs à l'efficience économique et l'importance sociale des divers types de pêche. Le discours sur le développement est souvent éloigné des pratiques mises en oeuvre; mais ce discours se rattache aux "préconceptions" (Chauveau, 1983) de ce qu'est l'activité de pêche et de ce que "doit-être" le "développement". Il s'agit de faire justice de ces mythes en s'appuyant sur des travaux de recherche de base indispensables à la compréhension du secteur en tant que totalité structurée dans un environnement national et international en rapide évolution.

I. PECHES, DEVELOPPEMENT, MYTHES ET REALITES

"LA PECHE INDUSTRIELLE EST EFFICIENTE ECONOMIQUEMENT, LA PECHE ARTISANALE EST EFFICIENTE SOCIALEMENT"

Le cas sénégalais nous enseigne que la plus efficiente des deux formes n'est pas celle qui repose sur une technologie lourde.

Investissements

Les artisans travaillent avec plus de 70% de fonds propres, contre 4 à 5% pour la pêche industrielle, laquelle bénéficie des avantages substantiels du code des investissements, du Crédit Maritime, de l'aide des banques et organismes financiers (Fréon et Weber, 1981; Fontana et Weber, 1983; Aubertin, 1983; Chauveau, 1983).

Profits

Les taux de profit du capital $\frac{\text{(Produit net)}}{\text{(Capital investi)}}$ sont de l'ordre de 50 à 70%/an en pêche artisanale, contre 3 à 7% dans la pêche industrielle.

Emplois

L'industrie emploie 2 700 marins; l'artisanat en emploie 27 000 (Soceco et Pechart, 1982; 1983).

Pour le prix d'un sardinier employant 12 personnes, on peut équiper 50 unités artisanales de senne tournante, employant 1 500 personnes et produisant 30 fois plus de poisson.

Le coût de création d'un emploi est de FCFA 0,2 million dans l'artisanale contre FCFA 4,4 millions dans l'industrielle.

Utilisation des captures

La pêche industrielle rejette au moins 45% de ses prises, contre moins de 5% pour la pêche artisanale, celle-ci livrant aux transformatrices (donc créant de la valeur) les espèces non commercialisables en frais (mais pas seulement celles-ci).

Notons que les rejets de poisson mort ne sont pas pris en compte dans le discours sur l'efficacité, celui-ci reposant sur des critères de rentabilité de la firme et non sur celui des coûts ou bénéfices pour la collectivité.

Utilisation de la ressource

La pêche artisanale est incomparablement plus sélective que la pêche industrielle.

De plus, dans le cas sénégalais, on observe des tentatives spontanées d'auto-réduction des captures, pour faire face aux fluctuations de cours, sur certaines espèces (pélagiques). La pêche artisanale peut réagir avec beaucoup plus de souplesse aux variations de l'environnement, écologique et économique (Freon et Weber, 1981; Weber, 1980).

Création de richesse

Le taux de valeur ajoutée (seul critère pertinent d'évaluation de la création de richesse) se situe aux environs de 60% en pêche artisanale contre moins de 30% en pêche industrielle.

Exportations

Quarante pour cent des exportations (équivalent frais) sont fournies par l'artisanat, représentant moins de 10% de la valeur totale des approvisionnements des exportateurs.

L'illusion d'une supériorité de l'industrielle pour la création de richesse ne viendrait-elle pas de là?

Ainsi, la pêche artisanale apparaît comme la plus efficiente, socialement et économiquement, du point de vue de la ressource, de la collectivité nationale et de l'entreprise.

LE DISCOURS DU DEVELOPPEMENT ET DE LA PLANIFICATION

La logique qui sous-tend les discours dominants sur le développement des pêches est à peu près la suivante:

La pêche artisanale est une forme de production "dépassée", qu'il s'agit de faire évoluer vers des formes "supérieures", d'abord semi-industrielles, puis industrielles dans un second temps. Quel pays (en développement ou non) n'a pas dans ses cartons des projets de flottilles "de transition" ou "intermédiaires"?

On compte sur les "effets d'entraînement" de l'industrie pour contribuer à l'accumulation du capital. Et sur les devises tirées de l'exportation pour équilibrer le commerce extérieur. Quand à la pêche artisanale, elle "fournit des emplois et nourrit l'intérieur". De là à confondre l'entrée de devises avec le solde des exportations, ou mieux encore l'entrée de devises avec la création de richesses, il n'y a qu'un pas vite franchi. "Le pétrole bleu, avenir du Sénégal: la pêche, premier secteur de l'économie avec 20% des recettes d'exportation" titre la presse nationale.

On accordera donc des subventions à l'exportation, des crédits aux industriels et les avantages substantiels d'un code des investissements généraux.

Les difficultés d'approvisionnement du marché intérieur sont attribuées aux marges excessives d'une profession dont la "moralisation" est présentée comme panacée. L'intermédiaire n'a pas le même statut social suivant qu'il écoule ses produits vers les marchés de l'intérieur ou à l'exportation. Dans le premier cas, il n'a pas accès au crédit et recourt à des matériels vétustes, souvent renouvelés; son image officielle est celle d'un "profiteur". Dans le second cas, il accède à l'aristocratie des "Opérateurs économiques", aux honneurs, aux crédits, aux avantages divers, subventions, code des investissements. Plus d'une société auréolée du prestige de l'Exportateur ne doit celui-ci qu'au labeur vilipendé des mareyeurs qu'elle emploie (SEPM, 1980).

Le caractère "dépassé" de la pêche artisanale se traduira par une énergie peu commune déployée pour remplacer la pirogue par des embarcations "plus efficaces" mais qui ont toutes, jusqu'à présent, démontré leur infériorité, sauf sur le plan du prix de revient, ô combien supérieur! (Fréon et Weber, 1981; Brendel, 1983; SEPM, 1980).

Quant à la transformation artisanale, il s'agit aussi de la faire "évoluer", d'augmenter sa productivité, de telle sorte qu'elle puisse... exporter. Ce qu'elle fait déjà, bien qu'à travers des circuits non contrôlés, "non structurés".

Cette logique de développement se traduit en chiffres:

Captures débarquées au Sénégal = 100%		Financements inscrits au plan = 100%	
Pêche artisanale:	65%	Pêche artisanale:	23%
Pêche industrielle:	35%	Pêche industrielle:	77%

(d'après Sénégal, Ministère du Plan et de la Coopération, 1981)

Les préconceptions à l'épreuve des faits

Quatre années d'observation, confirmées par les travaux d'autres équipes à travers le monde, montrent qu'en aucun cas il n'existe de "filiation" entre pêche artisanale et pêche industrielle: il s'agit de deux formes radicalement différentes d'exploitation des mêmes ressources. La pêche artisanale évolue, rapidement... vers une pêche artisanale plus performante, non pas vers une quelconque pêche industrielle (Chauveau, 1982). La pêche dite industrielle répond (ou devrait répondre) à une logique d'entreprise; la pêche artisanale trouve un compromis entre logique d'entreprise et réponse aux problèmes des sociétés rurales des pays en développement: disponibilité monétaire et emplois. On "invente" en Occident le partage du travail, sur quoi se fonde la pêche artisanale[1/] et bien souvent l'agriculture et l'artisanat, dans des pays à sous emploi tragique; dans ces mêmes pays, par un curieux retournement, les "experts" accorderont les faveurs de l'investissement à des activités à faible utilisation du travail. La pêche artisanale démontre quotidiennement, au Sénégal, qu'il est possible de concilier rentabilité élevée du capital, faiblesse de l'investissement et forte utilisation de main-d'oeuvre, taux élevé de valeur ajoutée.

Qu'en est-il de la contribution de la pêche à la richesse nationale? On ne répètera jamais trop que celle-ci ne s'évalue pas en entrée de devises, mais en valeur ajoutée. Or, la valeur ajoutée par l'ensemble du secteur ne représente guère que 4 à 5% de la PIB. Sur FCFA 37 milliards d'exportation, il ne reste guère que 10 milliards dans le pays. Encore faudrait-il prendre en compte le poids des subventions, détaxes, avantages fiscaux, prêts bonifiés, etc., pour l'instant mal évalués. Si la pêche peut et doit jouer un rôle important dans le développement, les évaluations économiques qui en sont faites ne conduisent-elles pas à placer en elle des espoirs démesurés par rapport à la réalité?

1/ Tel est l'argument explicite des pêcheurs pour expliquer des équipages supérieurs aux besoins: "il faut donner du travail aux frères pour qu'ils puissent dresser la tête au lieu de mendier" (interview de pêcheur à Djifère.)

Comment définir pêche industrielle et pêche artisanale?

Certaines pirogues sont plus grandes que certains chalutiers; la taille des embarcations n'est donc pas un critère pertinent et absolu.

La rentabilité du capital n'est pas non plus un critère discriminant nous l'avons vu.

Les deux formes de pêche se distinguent par la proportion d'inputs importés. Les unités industrielles sont entièrement importées, quand la pêche artisanale n'importe que ses moteurs hors-bord et ses filets synthétiques. Le carburant représente 12 à 16% du chiffre d'affaire des unités artisanales, contre 25 à 30% pour les unités industrielles: 190 litres par tonne débarquée artisanalement, contre 450 litres par tonne débarquée en pêche industrielle.

La gestion, nous l'avons vu, n'est pas non plus un critère à l'avantage de la pêche industrielle, et elle peut encore être notablement améliorée par des actions de formation en pêche artisanale.

Les deux formes de pêche se trouvent en concurrence sur de nombreux stocks. Elles n'en sont pas moins complémentaires: les unités industrielles peuvent accéder à des stocks inaccessibles aux pirogues, stocks hauturiers, stocks profonds, ou stocks côtiers impliquant le recours à des engins que ne peuvent utiliser des pirogues (chalut à crevettes par exemple). Il s'agirait donc de passer du discours évolutionniste à une planification des choix technologiques basés sur des critères d'accessibilité des stocks en n'oubliant pas qu'un choix technologique est un choix social.

En fin de compte, la différence la moins pertinente n'est peut-être pas celle-ci, avancée sous forme de boutade: "la différence entre pêche industrielle et pêche artisanale est que dans l'industrielle, le capitaine est à l'abri".

II. PLANIFICATION DU DEVELOPPEMENT, DEVELOPPEMENT DES RECHERCHES

LA RECHERCHE DE BASES CONCEPTUELLES

A l'heure actuelle, dans de nombreux pays, pas seulement en développement, le plan se résume à un catalogue de projets, sans visée globale cohérente. Pour que celle-ci soit possible, il est indispensable que l'activité de pêche soit pensée comme une totalité structurée, de la capture à la consommation, chaque élément de cette totalité participant de tous les autres et ayant sur eux des effets précis, dans un contexte national et international en évolution rapide.

Il ne s'agit plus de s'appuyer sur le "bon sens", mais sur des travaux de recherche méticuleux, pluridisciplinaires, de longue haleine. Pas de planification des pêches sans évaluation rigoureuse des ressources et de leur capacité de renouvellement. Pas de planification des pêches sans évaluation rigoureuse des coûts et des revenus aux différents niveaux du système, sans analyse précise des interrelations entre ces niveaux.

Nous l'avons vu, il y a loin de la réalité des faits aux discours dominants qui rejettent vers le "social" la pêche artisanale et pour cela en prônent la préservation. Que dire d'une "science" économique qui jette vers le "social" (i.e., l'incontournable) ce qu'elle refuse d'appréhender? Dépassant quelque peu la recherche d'une allocation optimale des ressources, refusant le "bon sens" comme catégorie scientifique, l'économie dont nous prévalons veut se donner comme champ l'étude des bases matérielles des rapports sociaux.

L'EXAMEN DES CHOIX TECHNOLOGIQUES

Ainsi la technologie est-elle inséparable du contexte économique et social dans lequel elle est mise en oeuvre (ORSTOM-CVRS, 1979). Il n'est pas évident que les techniques dites avancées (ce qui signifie souvent lourdes) soient les plus efficientes économiquement et socialement: l'exemple de la pirogue sénégalaise, jusqu'à présent inégalée en dépit des efforts répétés à grands frais, en est une démonstration.

On peut se demander si les "meilleures" innovations ne sont pas susceptibles de provenir des sociétés de pêcheurs elles-même; innovations techniques, mais aussi et surtout innovations "sociales" fournissant les "encadrements" (Gourou, 1982) sans lesquels la technologie reste sans effet. L'échec répété et généralisé des coopératives de pêche est là pour le rappeler brutalement: une technologie ne produit ses effets qu'à travers un processus d'appropriation social par ceux qui la mettent en oeuvre.

Nous retrouvons ici, indirectement, une autre différence importante entre formes artisanale et industrielle. En pêche industrielle, l'activité est subordonnée à un certain type de technologie; en pêche artisanale, la technologie est appropriée par les pêcheurs (et non "adaptée" aux pêcheurs), subordonnée aux conditions sociales de sa mise en oeuvre.

L'INDISPENSABLE RECHERCHE DE BASE

Produire des scénarios d'aménagement, fournir les éléments nécessaires à la prise de décision cohérente et les moyens de tester les effets de cette décision aux différents niveaux du système, tels sont les buts poursuivis par la recherche.

Cela suppose un énorme travail de collecte de données de base sur de longues périodes, tant biologiques, qu'écologiques, économiques, sociales et historiques.

Cela suppose la liberté du chercheur, pas toujours évidente en de trop nombreux pays; cela suppose que la recherche soit envisagée comme base de la planifcation, non comme son alibi.

Ici encore, les faits mettent les discours à rude épreuve: qui ne prône en effet le nécessaire développement de la recherche? Mais la recherche, comme le développement, est insérée dans la division internationale du travail dans en monde en crise. S'il est relativement facile de financer des travaux sur des problèmes industriels il est loin d'en aller ainsi pour des recherches sur la commercialisation locale ou la transformation artisanale.

Il est plus aisé d'obtenir un ordinateur de grande puissance que le salaire de deux enquêteurs, un véhicule que du carburant, de financer des équipements que leur fonctionnement.

III. MARCHE MONDIAL ET PECHE ARTISANALE

L'intérêt pour le maintien, voire le développement de la pêche artisanale, est récent. Si on lui reconnaissait volontiers une fonction "sociale", seul l'IRCLAM démontrait son efficience économique (Thomson, 1980), ses capacités d'évolution, d'adaptation aux situations de crise, suivi par d'autres équipes - dont celles du CRODT (Weber, 1980) et de Rhode Island University (Sutinen, Pollnac, Josserand, 1981). En Afrique de l'ouest, il y a peu, parler de l'efficacité de la pêche artisanale ou du mareyage "traditionnel" était suspect de passeïsme.

Contradictoirement, l'intérêt nouveau et généralisé accordé aux pêches artisanales ne doit pas être constaté sans méfiance par l'observateur.

L'ACCES A LA RESSOURCE ET FLOTTILLES "LOINTAINES"

La création des ZEE rend plus difficile et précaire l'accès aux stocks par les grandes nations de pêche. L'évolution du coût du carburant à son tour renchérit celui du poisson, le plaçant à un niveau voisin de celui des volailles et au-dessus de celui des produits laitiers.

Les armements "industriels" nationaux ont, dans l'ensemble, fait long feu. Coût du carburant, frais financiers, coût des équipements ont sérieusement érodé des marges bénéficiares étroites. Les pays du Tiers-Monde deviennent le déversoir des vieilles unités semi-industrielles des pays riches et la conséquence en est l'âge respectable des armements nationaux: de 17 à 24 ans d'âge moyen selon les types de bateaux au Sénégal.

PECHE ARTISANALE ET EXPORTATION

Dans ce contexte, la pêche artisanale peut devenir "intéressante" pour l'approvisionnement des pays riches. Moins consommatrice de carburant (12 à 16% du chiffre d'affaire contre 25 à 30% dans l'industrielle), utilisant une main d'oeuvre nombreuse mais peu rémunérée (de l'ordre de FCFA 20 000/mois contre FCFA 50 000 dans l'industrielle), elle débarque à des prix de loin inférieurs à ceux de la pêche industrielle. Evolutive, la pêche artisanale peut augmenter son rayon d'action, améliorer la conservation à bord donc la qualité du produit (Weber, 1982).

Dans toutes les périodes de crise d'approvisionnement des pays riches, les pêches artisanales ont connu un fort développement. Ce fut le cas de celle du Sénégal à la faveur des deux guerres. Dans les années cinquante, les industries du poisson étaient approvisionnées en quasi totalité par la pêche artisanale, laquelle s'est ensuite autonomisée progressivement avec le développement du mareyage en frais vers l'intérieur (Chauveau, 1983)

LA LOGIQUE DE LA DEPENDANCE

A l'heure actuelle, au Sénégal, la commercialisation intérieure n'a pas accès au crédit, est décriée socialement et très rigide: les gains de productivité physique dans la pêche se traduisent à la fois par des baisses de prix et un accroissement des rejets en mer, sauf pour les espèces destinées à l'exportation: céphalopodes, crevettes, rougets, soles, langoustes (Kebe, 1982; Chaboud, 1981; Deme, 1983).

Déjà, la pêcherie artisanale de céphalopodes est encouragée par les industriels japonais qui se procurent ainsi un produit moins coûteux que s'il était pêché par les unités industrielles. On peut se demander si le Japon n'est pas le précurseur d'une situation pouvant se généraliser au moins partiellement.

On pourrait à première vue s'en féliciter: les pêcheurs nationaux contribueraient ainsi à l'entrée de devises et à la richesse nationale, tout en s'appropriant les ressources nationales. Ce serait oublier les précédents du cacao, du café, etc. Ce serait oublier que le prix des céphalopodes - mais aussi celui des moteurs hors-bord - se décide à Tokyo; que ceux des pélagiques se fixent à Las Palmas. Ce serait oublier enfin que dans les circuits internationaux de commercialisation la valeur ajoutée est réalisée par le dernier maillon de la chaîne; que les prix aux diverses étapes du procès de production ne découlent pas des coûts de production mais du prix de vente final.

Nous avons tenté dans le passé (Weber, 1974) de montrer que le système commercial du cacao et du café se satisfait très bien de structures familiales de production à faible productivité à l'hectare. Ces activités, en Afrique, sont essentiellement entre les mains de petits producteurs dont le sort se règle à New York, Londres, Rotterdam.

Il pourrait en être ainsi demain des pêcheurs artisans du Tiers-Monde si l'on n'y prend garde: ceci expliquerait en partie l'intérêt soudain qu'on leur accorde. S'assurer la maîtrise des ressources suppose d'en contrôler la commercialisation, pas seulement la production.

La bataille des ZEE se gagnera ou se perdra plus sûrement sur ce terrain là que sur celui du niveau technologique des unités de production ou celui des modes d'accès à la ressource.

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A PROPOSED FAO STRATEGY FOR INTEGRATED DEVELOPMENT IN SMALL-SCALE FISHING COMMUNITIES

by

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ABSTRACT

The paper indicates the main documents to be taken into consideration in devising programmes for development of small-scale fisheries.

BACKGROUND

The role of small-scale capture fisheries as a source of food fish and employment in developing countries is now well documented and acknowledged. There is also an emerging awareness of advantages of small-scale fisheries in comparison with industrialized fisheries for economical and efficient harvesting of near shore resources. These include:

- the relatively labour-intensive and capital-sparing technology;
- less dependence on imported technology and supplies;
- often a higher return to capital (which can be invested in conveniently small quanta)
- the very important fact that small-scale fishing vessels can often keep operating when larger, more sophisticated vessels are tied to the dock for lack of adequate technical attention or spare parts.

Many governments understandably place a high priority on programmes of assistance to their small-scale fishing communities and have requested collaboration and support from international development agencies. The resulting projects, however, have often dealt only piecemeal and only for one or two years, at most, with one or two aspects of the complex of developmental problems involved. Among these problems are near-shore resource allocation and management, technical and social aspects of capture, processing, and marketing, distribution of income, competition by large-scale fisheries operations, credit, alternative sources of employment, community welfare, and community values.

FAO and other development groups have in the past often devised and employed reasonable and even temporarily reasonably successful approaches to many of these problems, but almost always dealing only with at most a few aspects, for a relatively short period of time, of what is really an interlocking complex of problems.

These efforts have often been additionally hampered by being critically dependent on two development institutions, cooperatives and extension services, which have been borrowed whole from agricultural development practices without adequate modification to fit the realities of small-scale fisheries.

Fisheries cooperatives, in addition to the problems they normally face in agriculture, are confronted with the basic and unalterable fact that small-scale fishermen on different boats are in direct competition with each other for capturing fish and in most cases for selling them also. Cooperation in production and mutual loan guarantee schemes are, therefore, in some important ways in conflict with the fisherman's own economic self-interest. Moreover, the extremely perishable nature of the product demands rapid and efficient

business management ashore, but since fishermen tend to live in a strip along the shore, most rural fisheries cooperatives are either too small to be able to afford a good (unsubsidized) manager, or else too strung out along the coast to be able to attend meetings. In addition, fishermen are only one part of the multidisciplinary community-based group which works to keep a small-scale fisheries fleet operating, and the other parts need to be included for realistically integrated development.

Those fisheries cooperatives which are successful usually have high quality government subsidized or volunteer managers (most projects), or simply incorporate the traditional village authority structure (Belize), are very large and near a large urban market (Bombay), or have been given in effect ownership of most of the near-shore fisheries resources (Mexico and Japan).

It is difficult to find a really effective small-scale capture fisheries extension service, although there are many successes in agriculture and aquaculture. Small-scale fisheries extension services have usually followed the agricultural model of sending a generalist extension officer to promote things in the fishing village. Unlike in agriculture and fish farming, however, there is usually no simple "crop production package" to be promoted. Compared to small-scale agriculture, small-scale fisheries requires mastery of a considerably greater body of technical knowledge and a skilled multidisciplinary team to apply it (see Figure 1): boatbuilding, gear construction, seamanship and navigation, fishing methods, motor maintenance, continuous provision of bait, fuel, ice, and other supplies, plus rapid processing and marketing. The fishing village maintains a whole team of people to carry out these functions, and the generalist fisheries officer is usually less skilled in all of them than the village practitioners. As a result, he usually ends up collecting statistics, trying to support the usually ailing local fisheries cooperative, or at best working as a rural fisheries credit officer worried about all those overdue loans. Successful small-scale fisheries extension will require a skilled multidisciplinary technical team working in the context of a definite, adequately supported development programme.

PURPOSE

The proposed FAO Strategy for Integrated Development in Small-Scale Fishing Communities, described here, is designed to bring together in a coordinated fashion various successful approaches to particular problems, many of which have already been used in our field projects, and weld them into a cohesive, integrated, and sustained programme of support for development in small-scale fishing communities.

OBJECTIVES AND PRINCIPLES

Projects operating under this programme will be centred on fishing communities with the aim of promoting equitable, self-reliant economic and social development of the small-scale fisherfolk, in particular through access to the appropriate technology, physical and financial resources, organizations, and training required for the properly managed development of the fishing community, as well as being concerned with the essential infrastructure for community welfare.

In pursuit of these objectives, the following six guiding principles will be used in planning and implementing all associated projects:

(1) an integrated approach to both production and community welfare needs;

(2) participation by the small-scale fishing community in both planning and implementation;

(3) mobilization of the local development effort, so that outside support remains supplementary or catalytic;

(4) long-term technical support and in-service training to the fishing community provided by a programme-related and government sponsored Fisheries Development Unit;

(5) continuing and protected use of the fisheries resource;

(6) explicit attention to the role of women in production and family maintenance, so that their status is not harmed by project actions.

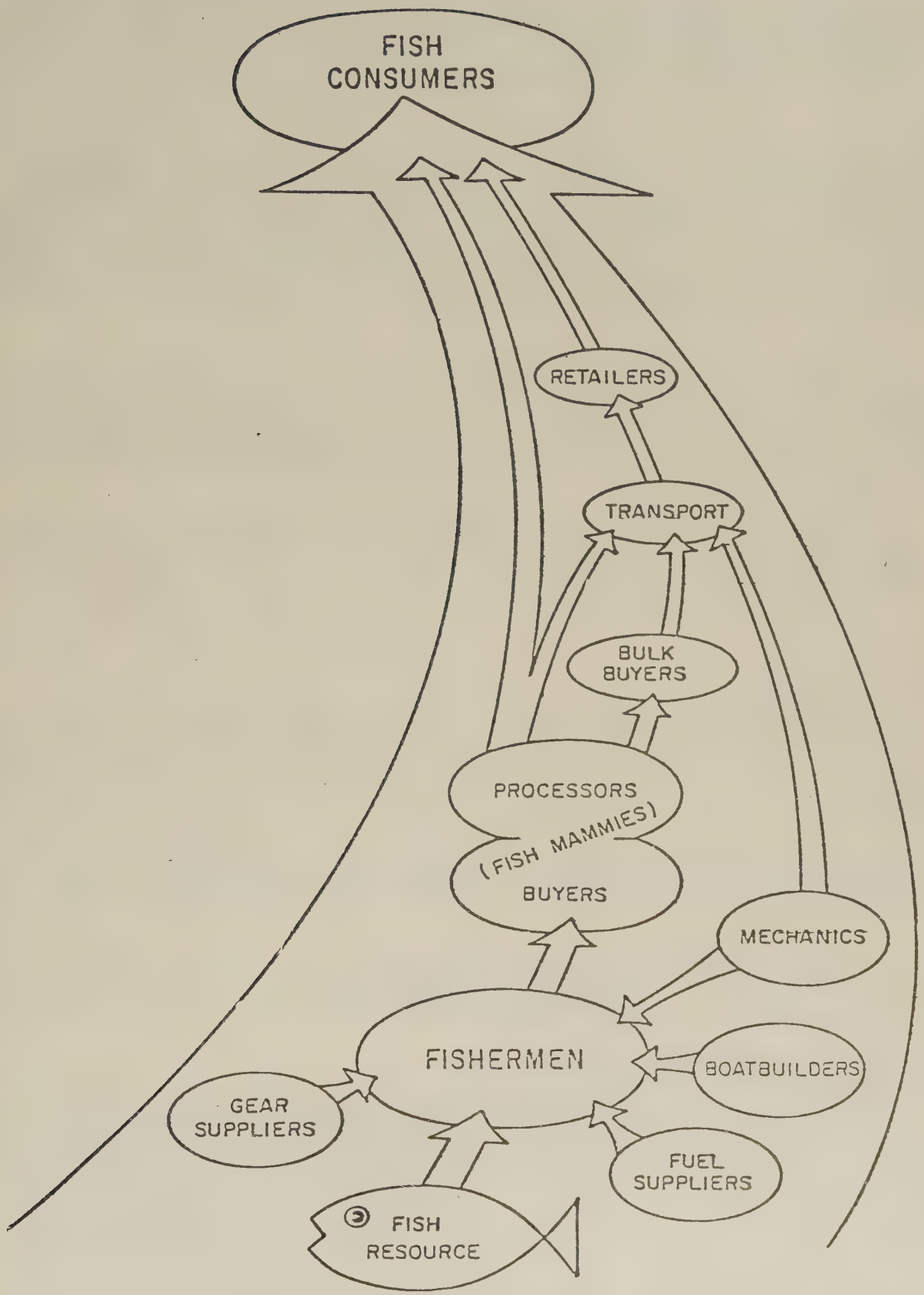

Figure 1 Structure of a traditional West African small-scale fisheries community

PROJECT STRUCTURE, COMPONENTS, AND SEQUENCE

Regional FAO Small-Scale Fisheries Development Group

Essential to the strategy are regional or sub-regional teams of experts (usually a Team Leader, fisheries sociologist, extension expert, and technical expert), who will provide an umbrella under which to help plan, obtain funding for, initiate, supervise, evaluate, revise, and otherwise provide close and frequent support (including appropriate orientation and field training, for national and international specialists) for national small-scale fisheries community development projects in their region. They will concentrate on such integrated national projects and not dissipate their scarce time and resources on short-term, unintegrated, *ad hoc* consultancies. The individual national projects will not be directly funded by the programme, but by donors or banks interested in funding those particular national projects.

One of the "problems" of well-designed small-scale fisheries development projects is that the yearly investment absorption capacity is relatively small, and well below the minimum lending level of regional banks. It is, therefore, of particular note that several regional banks have expressed interest in the possibility of financing regional small-scale fisheries development loans, to be coordinated through the proposed FAO Regional Small-Scale Fisheries Development Group into associated national projects. The regional group could probably effectively supervise some 5-8 such national projects.

Where appropriate and feasible, the Regional Group will also directly support and operate a model project area as a testing and training group for other similar projects in that region (see Figure 2).

NATIONAL PROJECTS

Fisheries Development Units

The fundamental units of the Programme strategy are individual fishing communities working on their own self-development projects. The basic operational national project will encompass a group of such participating fishing communities spread perhaps 30-300 km along the coast, assisted by a Government Fisheries Development Unit which provides technical support, funding coordination and essential material support, and ensures that the individual community development plans in its zone of operations are both complementary and coordinated with each other. The Fisheries Development Unit will be staffed with the multidisciplinary team of specialists required to support the fishing community projects, initially both national and international personnel but gradually evolving to be wholly nationally staffed.

The Fisheries Development Units themselves will concentrate on fisheries-related work, but will cooperate with community groups in identifying and obtaining other outside assistance needed for such community needs as education, health, water, transport, housing, and alternative sources of employment.

Fishing Community Organizations

Since the national projects are to rely heavily on local community initiative, participation and support, the project organization at the level of the fishing community is critical. Its structure can be divided conceptually into three parts. These include some kind of planning and management group representing the various disciplines involved in small-scale fisheries production (boats, fishing gear, motor maintenance, fishing supplies, fishermen, small-scale processors, small-scale distributors, etc.): the integrated group of physical structures and equipment needed to carry out that production; and the local fisherfolk who have the task of actually working at these essential jobs. The relation of the local planning/management group to the existing community structure of authority and influence and the manner in which the members of the planning/management team are selected is an issue both crucial and delicate, and will require the most careful attention of the government, programme, and community interests in each case to arrive at a mutually acceptable formula.

These three aspects of fishing community involvement taken together have sometimes been called a Community Fisheries Centre. They provide a useful framework and focus for the involvement of the local fisherfolk in their own development. It should be emphasized that the form of ownership of the physical infrastructure can range from totally private ownership to fishermen's unions to cooperatives, and even state enterprise.

PARTICIPATORY STRUCTURE

Experience in agriculture has shown that it is difficult if not impossible for a normal, hierarchically authoritarian bureaucracy to interact with local communities in a truly participatory way. Such interaction has been achieved, however, by a partly autonomous appendage of the mainline bureaucracy when the appendage is itself organized on at least a partially participatory basis. The Fisheries Development Unit can provide such a needed transitional bureaucratic form for the national Government, while the Regional FAO Small-Scale Fisheries Development Group can play a similar role for the FAO bureaucracy.

PROJECT TIME SEQUENCE

Most small-scale fisheries development projects have been carried out in two major phases: site identification (coupled with project formulation and government approval), followed by the implementation phase in which the project experts try to convince the local fisheries community that they really want and need what the project is offering.

The programme proposed here offers, by contrast, a three phase project cycle which includes, after the first phase of site identification, a very substantial second phase of participatory project planning in a joint effort between the Government, the local fishing communities involved, and the Regional FAO Small-Scale Fisheries Development Group. It is during this participatory planning phase that the national Fisheries Development Unit, if not previously existing, begins its career in embryo as the Government partner in the participatory planning operation (see Figure 3).

The planning phase itself, carried out over a period of months in each fishing community separately (with complementary and coordination being looked after by the Fisheries Development Unit and attached members of the FAO Regional Group) ideally can be subdivided into various phases, as shown in Figure 4.

REPLICATION AND MULTIPLICATION

The participatory planning and implementation process is usually not familiar to either Government or development agency, nor (at least in this context) to the local communities. A mutual learning process is involved, which in agricultural projects has been observed to pass through three phases:

- learning to be effective;
- learning to be efficient;
- learning to expand.

The same sequence should apply to participatory small-scale fisheries projects on both the national and regional level. Thus it is important to begin with a pilot project area, working there long enough to become both effective and efficient before expanding to new areas. A single Fisheries Development Unit and its group of associated fishing community projects should first be established and brought to a reasonable degree of proficiency before replicating the approach by means of additional Fisheries Development Units and groups of fishing communities in the same country. The new, second generation of Fisheries Development Units should reach efficient levels of operation much faster, of course, since its members will have previously learned the participatory aspects of their trade through being attached to the original national Fisheries Development Unit.

The usefulness, as a regional testing and training ground, of a national model pilot project operating under the close supervision and control of the Regional FAO Small-Scale Fisheries Development Group, becomes even more apparent in this learning connection, for the national experts designated to start up a country's first Fisheries Development Unit can be sent to the Regional Model Pilot Project to learn, hands on, how it is done even before their own national project is in operation.

PRESENT STATUS

A regional programme on the lines described has recently been funded for a five-year period by DANIDA, assisted by yearly contributions from Norway, and has just begun operations. Headquarters for the Regional Group, as well as the Model Pilot Project, are being placed in Benin. Negotiations are continuing for the establishment of similar programmes elsewhere, with East Africa high on the list of priorities.

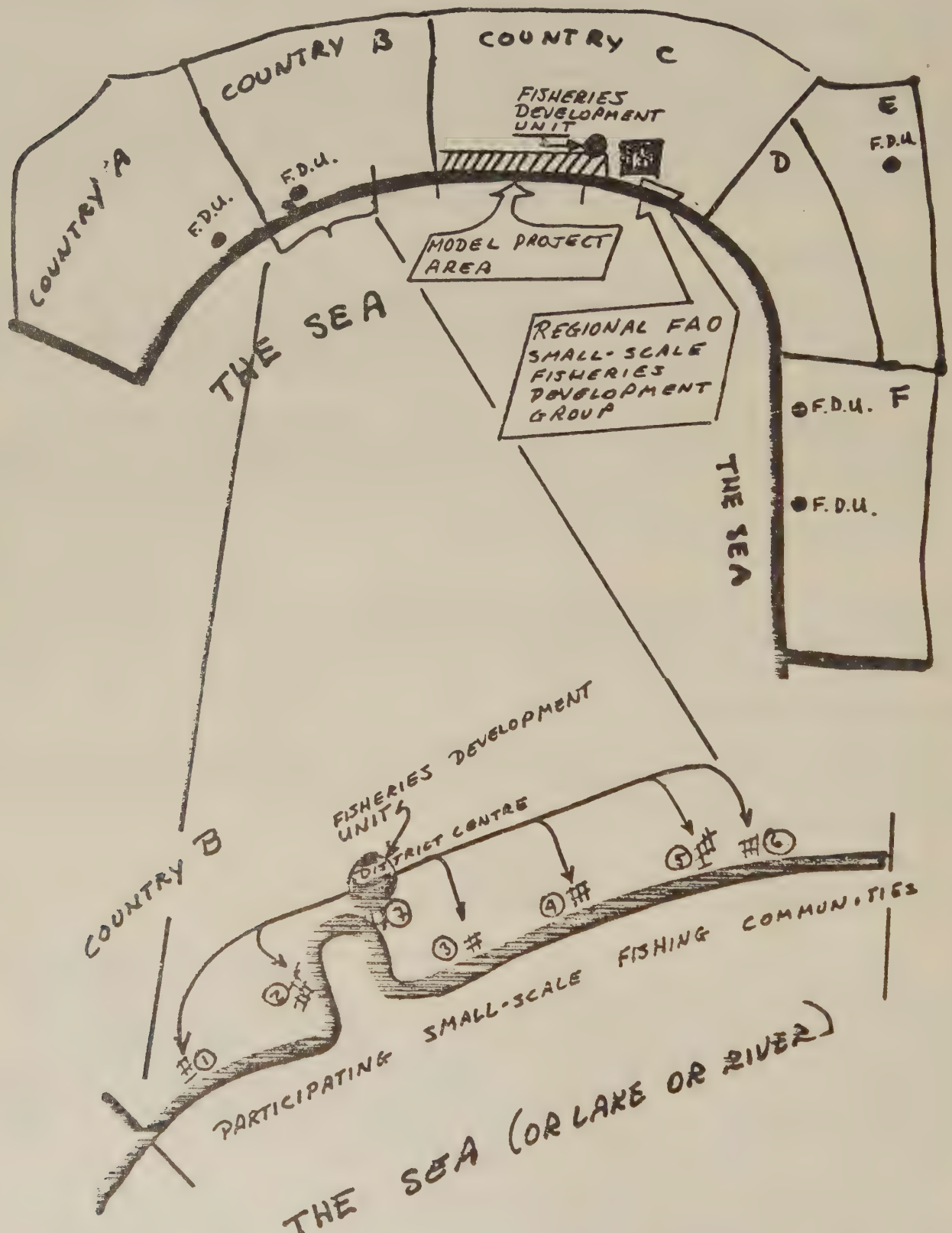

Figure 2 Geographical relationship of Fisheries Development Units, fishing communities, Model Project, and Regional FAO Small-Scale Fisheries Development Group

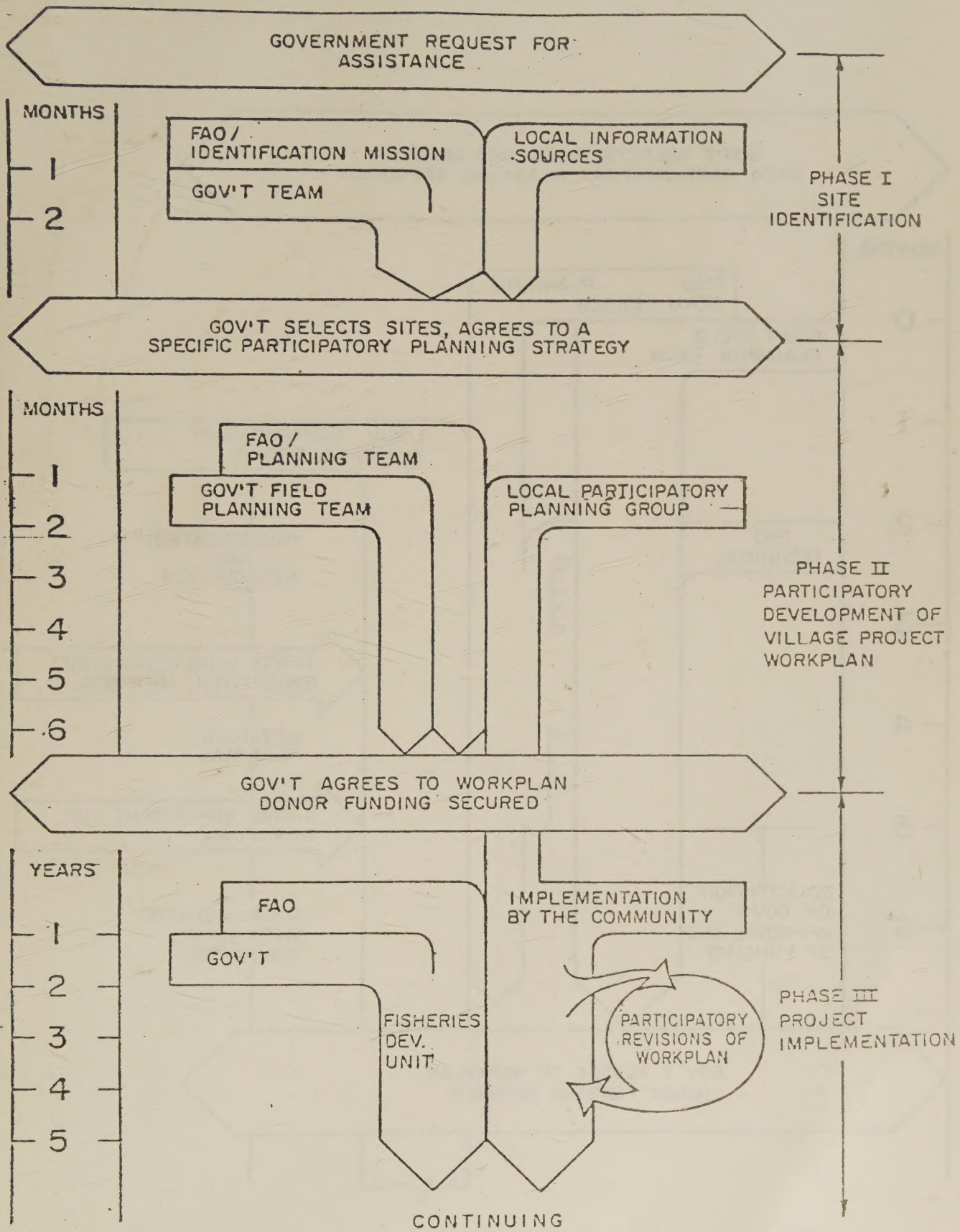

Figure 3 Identification, planning, and implementation phases of an integrated small-scale fishing community development project

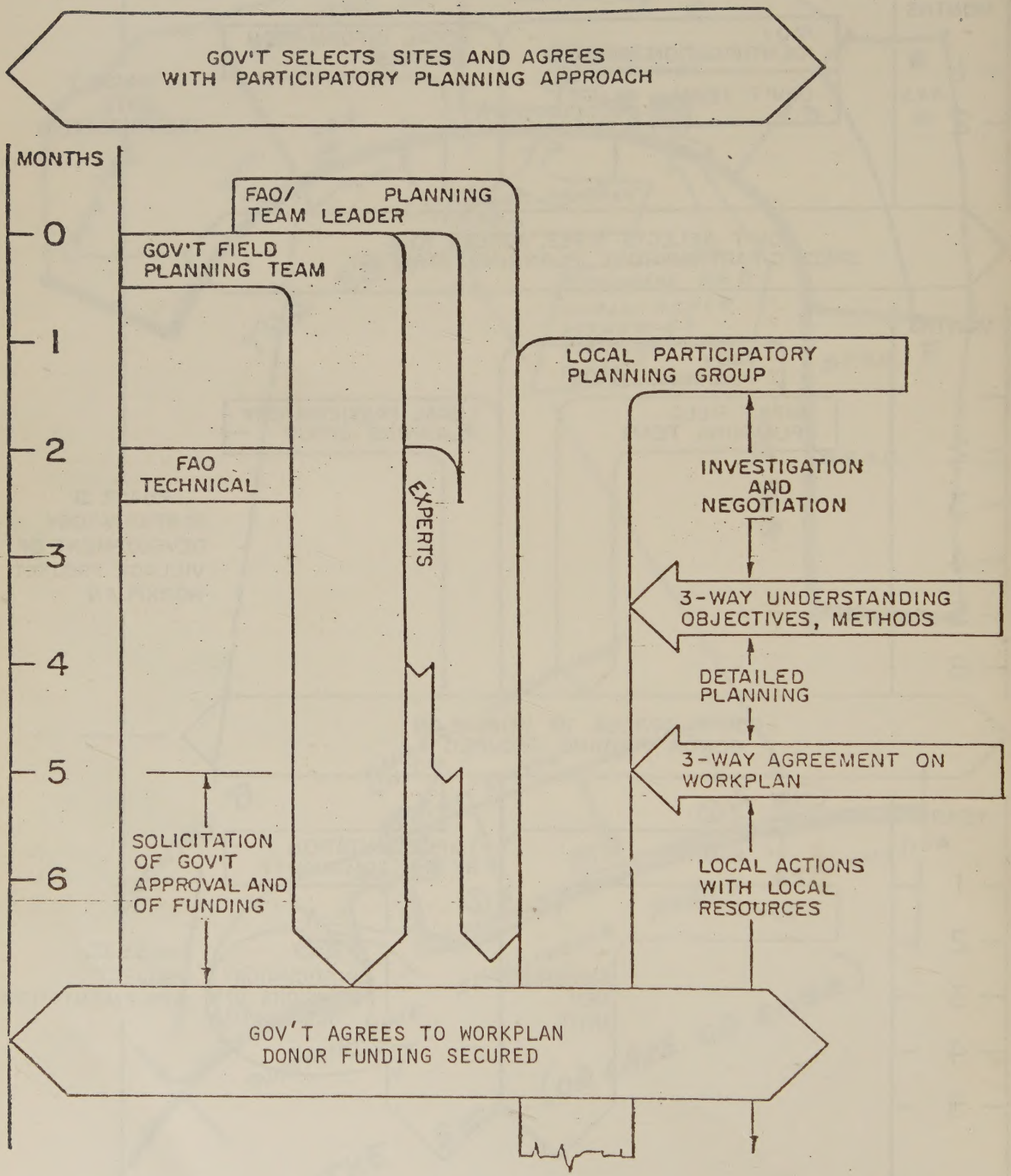

Figure 4 A more detailed look at Phase II, Participatory Planning

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